A Separate Personal Income Tax For Ontario:

Background Studies

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REFERENCE

Edited by D. W. Conklin

Ontario Economic Council

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A Separate Personal Income Tax for Ontario: Background Studies

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Ontario Economic Council
Special Research Report

ONTARIO MINISTRY OF
TREASURY AND ECONOMICS
dmw
AUG 21 1985
85/5097
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Ontario Economic Council
81 Wellesley Street East
Toronto, Ontario
M4Y 1H6

Printed in Canada

Canadian Cataloguing in Publication Data

Main entry under title:

A separate personal income tax for Ontario

(Special research report / Ontario Economic Council,
ISSN 0225-591X)
Includes bibliography.
ISBN 0-7743-8691-6

1. Income tax--Ontario--Addresses, essays, lectures.
I. Conklin, D.W. (David W.) II. Ontario Economic
Council. III. Series: Special research report
(Ontario Economic Council)

HJ4663.O5S4 1983 354.7130072'44 83-093048-5

This report reflects the views of the authors and not necessarily those of the Ontario Economic Council. The Council establishes policy questions to be investigated and commissions research projects, but it does not influence the conclusions or recommendations of authors. The decision to sponsor publication of this study was based on its competence and relevance to public policy.

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Council Foreword

This volume, edited by the Council's Research Director, David Conklin, constitutes the third tier of the Ontario Economic Council's response to a Reference from the Treasurer of Ontario requesting us to examine the economic implications that would attend a decision by the province to withdraw from the Tax Collection Agreements and institute its own collection system for the personal income tax.

Upon receiving the Treasurer's Reference in June 1982, the Council appointed Professor Douglas G. Hartle of the University of Toronto as Project Research Director. Professor Hartle's role was twofold - first, to assemble and oversee a research team that would prepare the descriptive and analytical material needed to assess the overall question of an independent personal income tax for Ontario and, second, to organize this material into an integrated background volume.

Building on Dr. Hartle's work, the Ontario Economic Council issued its official response in early 1983, A Separate Personal Income Tax for Ontario: An Ontario Economic Council Position Paper. Later in the year, the Council published the Hartle volume, A Separate Personal Income Tax for Ontario: An Economic Analysis. We wish to express our gratitude to Dr. Hartle for co-ordinating and overseeing this challenging task.

The present, and final, volume contains the background documents that were prepared in connection with the Reference.

The Council also expresses sincere appreciation to its staff for the many hours that they devoted to this project (Research Director David Conklin, Administrative Officer Sharon Wahl, Kathy Ashenden, Ann Chin, Nancy Cole, Doug Crocker, Tom Gerylo, Brenda Huff, Jim Leahy, Sylvia Machek, Nancy Savoie, Aly Sy, Sandra Tychsen, and Diane Wenzel).

Finally, the Council is very appreciative of the co-operation we have received from all quarters in connection with this reference. Treasury

and finance officials from Ontario, from other provinces and from the federal government, were most helpful to us. The Council is also grateful to several individuals for both encouragement and comments with respect to various aspects of this project.

Thomas J. Courchene
Chairman

Introduction

Canadian provinces have the constitutional right to establish their own separate personal income tax (PIT) systems. Quebec chose to create its own PIT system in 1954. The other provinces have chosen to be a part of the federal government's tax collection system. Each province decides upon a percentage of the federal tax that its residents add to their federal tax. A province may permit certain tax credits for particular types of income or groups of taxpayers. Taxpayers' provincial PITs are calculated on the basis of their federal tax returns, and the province receives its remittances from the federal government. From time to time, various provinces have considered following the Quebec example and creating their own separate PIT systems.

The studies in this book are designed to assist Ontario in reaching a decision about whether to establish its own separate PIT. The studies examine the ways in which a PIT can enable a government to achieve its objectives. For example, a government can use a PIT to change the financial incentives faced by individuals, and so change their behaviour. In particular, a PIT can affect decisions about saving, investment, and work. Consequently, a government may be able to use a PIT to alter the nature and pace of economic growth. A government can raise or lower PIT rates in hopes of moderating business cycles. Like Quebec, a province can establish its own separate PIT as a means of advancing its own unique political objectives.

The economies of the ten provinces differ substantially. Consequently, the PIT that is most appropriate for one province may not be optimal for the others, and the federal government's PIT base may not be a satisfactory base for some of the provincial PITs. It can be argued that Ontario should develop its own separate PIT to suit its residents' special needs and to foster the development of Ontario's unique economy. It can

also be argued that levying the Ontario PIT as a percentage of the federal PIT hampers the pursuit of Ontario's best interests. What can a province hope to achieve through the use of its own separate PIT? What are the limitations of a PIT's power to help a province attain its objectives? Can alternative mechanisms, such as specially designed expenditure programs, achieve the desired objectives in a better fashion? Would the administrative and compliance costs of a separate Ontario PIT be simply too expensive? The following studies seek to answer these and other questions.

The studies reveal the limitations of a separate provincial PIT. A government would not in fact be able to use such a PIT as easily or as effectively as might seem possible at first glance. Throughout the studies runs the theme that provinces are greatly affected by events and circumstances outside their borders. Canada is 'a small, open economy' and our provinces are even smaller and more open. The fact that labour, capital, and products can move readily from one province to another means that the special features of any one provincial PIT can be obviated to a large degree by migration, by capital flows, and by changes in trade patterns. For this and other reasons, considerable uncertainty surrounds predictions about the impact of any provincial PIT that is significantly different from those of the federal government and the other provinces. The administrative costs and the compliance costs of a separate PIT are substantial. Most government objectives that could be achieved through a separate provincial PIT could also be achieved through unique provincial expenditure programs. In Canada today, a powerful case can be made for tax harmonization and a unified national pursuit of economic goals. Consequently any province that considers the adoption of a separate provincial PIT will find some cause for hesitation in the studies in this book.

Nevertheless, the studies are useful for a province that does decide to institute its own separate PIT. They cast light upon the issues that must be considered in the design of any PIT. They indicate the ways in which a province might construct a PIT so as to achieve its desired objectives. They examine the side-effects and ramifications of particular PIT features. They provide guidance in the choice of an optimal PIT for a province in the Canadian federation.

Robin Boadway and Neil Bruce have contributed three separate papers to the volume, examining in turn the implications of a PIT for savings, pensions, and investment. Their first paper begins with a discussion of the motives underlying household saving and the ways in which a PIT may

affect them. They describe the significantly different types of PIT that can be instituted. In particular, a PIT can be levied on expenditure, on labour income, on total income, or on a base that mixes these elements. Boadway and Bruce note that the present Canadian PIT is such a combination and that it permits the sheltering of a considerable amount of capital income. They point to the openness of the economy and the rate of inflation as key determinants of the relationship between the PIT and savings. However, they conclude that 'the empirical evidence on the effects of taxation (and other variables) on saving is inconclusive at best....At the moment, "not proven" is the best verdict one can base on the empirical evidence of the effects of tax incentives on saving....' The authors do cast light on a number of provisions of the Canadian PIT, including 'the inadequate averaging provisions', and they discuss the level of Canadian savings, noting that 'recent measured saving rates in Canada are high by historical standards and in comparison with those of other developed economies.' The creation of an Ontario PIT that was optimal in its tax treatment of savings would, they feel, have relatively little impact on the welfare of Ontarians, saving them 'between $0.2 and 1 billion at most'.

The second Boadway and Bruce paper examines the implications of a PIT for pensions, particularly the implications of the special tax deductions allowed within the current Canadian tax regulations. The authors make the point that these tax provisions permit a form of income averaging that can be viewed as desirable on equity grounds. They consider whether current tax treatment is optimal in this regard. In addition, they focus on the way in which these provisions shift the tax system from a comprehensive-income base towards an expenditure base, and also on the way in which they implicitly provide indexation of the tax base for inflation. They note the role of public pension schemes and the role of owner-occupied housing as alternatives to, and supplements to, the private pension arrangements. A major concern in the pension literature has been the impact of public pensions on private savings, particularly when public pensions are not fully funded. After examining empirical analyses, they conclude that 'the evidence is conflicting'. Similarly, concerning the effect of public pensions on the decision to retire early, they note that 'the jury still appears to be out'.

The third paper by Boadway and Bruce considers the implications of a PIT for investment. Although most investment is undertaken by firms

that pay no personal taxes, a PIT does affect the cost of finance to such firms, largely through its impact on the supply of savings. Unincorporated businesses are affected directly by a PIT, and so the authors give their investment decisions special attention. They also consider methods of integrating a PIT with the corporate income tax. The discussion is based on a theory of the firm from which investment demand is derived. Many of the current Canadian tax provisions influence investment decisions. For example, capital gains are taxed at half rates, while dividends in the hands of firms are not taxed; interest is treated differently from dividends; tax-exempt vehicles such as pension funds are a source of finance. The authors offer the fcllowing conclusion:

> As we have seen, the openness of the economy greatly affects the PIT's impact on the cost of finance. If financial capital is free to flow into and out of the economy, if the economy is small, and if the taxes levied on capital income are fully credited in other jurisdictions, the PIT has no effect on the cost of capital and hence on corporate investment. It only distorts the savings decisions of individuals and influences the magnitude of capital inflows into the economy.

Boadway and Bruce believe that these conditions of openness exist in Ontario and that, consequently, an Ontario PIT would affect the cost to Ontario firms of only 'those kinds of capital whose sources or uses make them less than perfectly mobile across national or provincial borders.' The authors examine three areas in which an Ontario PIT might affect rates of return and, consequently, alter investment decisions: small business, housing, and human capital. Thus they consider, for example, the possible impact of an Ontario PIT on the retained earnings of small business as a result of special tax concessions, its possible effects on housing through mortgage-interest deductibility (particularly in times of high inflation and accelerated depreciation and 'soft' cost write-offs for rental units), and its influence on investment in human capital through income-averaging provisions. Finally, the authors consider the relationships between various possible PIT reform provisions, attainable through a separate Ontario PIT, and the existing corporate income tax (CIT) structure. They suggest, for example, that the CIT for small corporations could be fully integrated with the PIT. One advantage of a separate Ontario PIT would be the freedom to achieve an optimal relationship between the PIT and CIT structures.

Edwin Neave examines in considerable detail 'The Problems of Financing New, Small Business Ventures'. Neave emphasizes what he calls

'informational asymmetry' - the fact that 'the managers of a firm are likely to have specialized knowledge not always available to financiers'. This market imperfection means that capital markets will not be able to deal in a socially optimal manner with new, small business ventures.

> Informational asymmetry can explain a variety of financial practices including credit rationing, the use of collateral, restrictive covenants, and preferences for different types of capital structure. That is to say, almost all of the results of traditional financial theory require modification if they are to predict the financing decisions likely to be taken under conditions of informational asymmetry.

Neave examines each of these financial practices. He contends that the processing of the special information associated with new, small business ventures is both a skill acquired by experience and subject to increasing returns to scale - attributes that explain 'both concentration in financial intermediation and the failure of markets for some types of financial transactions to evolve.' American financiers seem to have developed more experience and more specialization in this area than have Canadian financiers. An Ontario PIT could help to overcome this deficiency by providing tax incentives for high-risk investments in small and medium-sized businesses. Neave examines existing government programs, including Ontario's Small Business Investment Corporations and Quebec's tax deductions for share purchases of certain Quebec corporations. He concludes that policy vehicles such as subsidies or loan guarantees may be more effective than special tax treatment.

The paper by Samuel Rea, Jr., examines the impact of a PIT on work incentives. Rea first presents a model of labour-force participation within which he analyses the ways in which a PIT can alter an individual's allocation of time between work and leisure. Then he considers a series of empirical studies that have tried to calculate the relationship between a PIT and work decisions. From these studies, he concludes that changes in PIT rates do not affect work-leisure decisions equally among all labour groups. For example, women are much more likely to alter their workloads in response to PIT changes than are men. Rea emphasizes that

> there are several reasons for concern over the labour supply effects of taxes and transfers. First, the taxes and transfers may reduce the annual hours of work. Second, the tax rates may be so high that reductions in tax rates will actually increase tax revenues (the Laffer Curve). Third, the taxes impose deadweight losses on society. It may be possible to reduce these losses by lowering the tax rates for those groups with the largest deadweight losses and raising the rates for those with the smallest deadweight losses.

Rea examines each of these issues, bringing available evidence to bear on his conclusions and recommendations concerning an optimal PIT rate structure.

The paper by Thomas Wilson is called 'Stabilization Policy Issues: an Appraisal of Possible Roles of Flexible Fiscal Policies in Ontario'. Wilson views stabilization policy 'as the attempt to improve economic performance with respect to the broad macroeconomic objectives of full employment, price stability, and adequate economic growth.' He believes that the primary responsibility for stabilization policy should be assigned to the federal government. Nevertheless, he acknowledges regional economic objectives and also different degrees and types of cyclical fluctuations in the different regions. Wilson believes that

> political tolerance of federal moves to accommodate regional disparities via a regionally discriminatory federal stabilization policy appears extremely limited, particularly in the case of restrictive fiscal policies. It follows that the use of provincial fiscal policies as an adjunct to federal policy - supporting federal policy in those provinces where the cyclical problem is more acute, and offsetting fiscal policies where the cyclical problem is less acute (or indeed opposite to that of the nation as a whole) - could improve the overall average performance of stabilization policy.

As a background for his later analysis, Wilson presents projections to 1990 for both the Canadian economy as a whole and its major regions. The Ontario economy is seen to be unique in its concentration on manufacturing, particularly durable-goods manufacturing. This uniqueness would be better served through a more flexible PIT than currently exists. However, Wilson points out that

> whether this range of choice could be accomplished without a separate Ontario PIT would depend on the degree of flexibility possible within the existing joint federal-provincial PIT system. For example, if the federal government were to accept separate provincial rate schedules and to permit implementation of savings and investment credits and other growth-oriented tax credits, this would provide the Ontario government with much of the freedom of choice to adopt growth-oriented policies it could attain by establishing a separate PIT.

In order to analyse the potential impact of an Ontario PIT on the Ontario economy, Wilson uses the FOCUS-PRISM model to conduct four fiscal experiments under two alternative monetary and exchange-rate regimes. These experiments consist of an increase in federal government spending on government fixed-capital formation, a similar increase in

Ontario government spending, a general reduction in federal income tax, and a reduction in Ontario income tax. The results 'suggest that fiscal policy for stabilization is feasible for the Province of Ontario.' While the effects do spill over into other provinces, a substantial impact remains within Ontario. Yet it is true that general Ontario PIT changes would have a low Ontario multiplier and would be less effective than more selective measures, such as sales tax changes for Ontario products or expenditure changes.

Wilson examines a wide range of arguments for and against a separate Ontario PIT. He concludes by emphasizing several steps that could increase the flexibility of the current system: separate provincial rate schedules, more extensive use of provincial tax credits, and use of special provincial deductions from taxable income. In order to maintain the economic union, such credits and deductions would have to be regionally nondiscriminatory.

Enid Slack examines the possibility of using an Ontario PIT as a mechanism for municipal funding. She considers a variety of arrangements for allowing municipalities to place a surcharge on provincial income taxes, evaluating them in terms of equity, efficiency, administration, and political criteria. First, Slack describes the existing municipal fiscal structure, with its heavy dependence on property taxes and provincial grants. Next, she presents the issues of determining a tax base for a PIT surcharge and deciding whether all municipalities should have the same rate of surcharge. Distribution formulae for taxes collected by the province could achieve various degrees of equalization. Finally, a PIT surcharge could either substitute for property taxes and provincial grants or add to existing provincial revenues. Slack argues for a uniform surcharge rate because locally determined rates 'would likely affect locational decisions and make the treatment of non-residents very complex... general administrative costs would be higher.' Slack emphasizes that a 'fiscal gap' exists between municipal spending responsibilities and taxing powers, and that the use of a municipal piggyback scheme on a provincial PIT would assist in closing this gap because of the PIT's high income elasticity compared with the property tax and the existing grant structures.

Since 1954, Quebec has collected its own separate PIT, using a set of tax regulations different in some important respects from the federal PIT structure. Claude Forget examines 'Quebec's Experience with the Personal Income Tax'. His paper stresses the significance of political motivations

and objectives in Quebec's 1954 decision to go its own way. Furthermore, Forget notes that 'what was really at stake, in an implicit and oblique way, was not only the power to tax but also the power to spend for provincial purposes.' By escaping from the federal leash of a centrally collected PIT, Quebec has been able to assert its positions more successfully in those spending programs that Ottawa has attempted to influence in its pursuit of national standards. In a broad sense, the Duplessis government of 1954 wanted to obtain the power to tax in order 'to sterilize, as it were, a part of the country's fiscal capacity and to slow down the growth of the government's role.' Forget's paper adds to the other studies this important emphasis on the political advantages to a province of having its own PIT - in particular, the ability to exert a larger influence on the nature and extent of government activity.

Forget discusses the various instances in which Quebec's PIT has departed from the federal structure, citing, for example, the province's 1973 decision not to follow Ottawa's 1972 lead with regard to indexing and the 'Parizeau Plan' of 1979, which allows Quebec residents to deduct up to $15,000 in computing their taxable income for Quebec purposes with respect to stocks purchased in certain Quebec companies. He concludes that 'a trend toward increasing divergence does seem to exist.' In fact, 'tax harmonization has a lower order of priority than almost all other objectives that mould a provincial PIT.' Forget clearly demonstrates that a separate provincial PIT can permit a province to pursue a variety of specific economic and social goals, quite apart from any political reasons for its implementation.

John Thompson's two papers consider the costs of implementing a separate Ontario PIT. First, Thompson examines the cost of government administration. He analyses the many different tasks connected with a separate PIT and he provides estimates of the personnel costs and other operating expenditures likely to be required by an Ontario PIT. These estimates are based on the actual experience of the federal government in its PIT collection activities. Annual operating costs are estimated at $120 million and a data centre would have a capital cost of about $60 million. Thompson derives a separate set of cost estimates by examining Quebec's PIT experience. These estimates are somewhat lower - $70 to $85 million for operating costs. Thompson concludes by suggesting that the probable annual cost would be in the range of $75 to $100 million. He draws attention to a number of intangible costs such as uncertainty and delays in

the implementation of tax changes and probable political dissatisfaction on the part of taxpayers.

Thompson's second study examines the costs to taxpayers and employers of complying with a separate Ontario PIT. A key issue in estimating such costs is the extent to which an Ontario PIT would diverge from the federal PIT regulations and thus require separate calculations and tax advice. Thompson uses both the Quebec PIT and the Ontario corporate income tax systems as models for analysing this issue, pointing in each case to significant differences between federal and provincial regulations. He goes on to estimate how much taxpayers would have to spend, in time or professional fees, in dealing with separate provincial tax returns. 'This very rough estimate indicates a cost of preparing returns on the order of $75 million to $225 million. On the basis of this quick and crude analysis, the cost of preparing returns could therefore be on the order of $150 million a year.' Additional annual costs of perhaps $10 million would arise in connection with the payment of tax instalments and dealing with provincial assessments and additional tax planning. Employers would experience annual costs ranging from $30 to $60 million in remitting their employees' deductions, plus start-up costs of similar proportions. Thompson estimates that 'the total costs of compliance would be $200 million annually.'

All of the research studies recognize the limitations imposed on an Ontario PIT by the fact that Ontario is part of the Canadian federal structure. The final four studies focus more specifically on this issue. Sam Bucovetsky deals with 'The Relationship between Geographic Mobility of Individuals and the Structure of the Provincial Personal Income Tax'. His concern is that 'any changes in the structure of Ontario's PIT may induce migration flows to and from Ontario. In assessing the effects of such changes one should know both how migration responds to the changes, and how this induced mobility affects the incidence of the changes.' Even the tax treatment of capital income can be a cause for migration. The ease with which people migrate within Canada limits the degree to which a separate provincial PIT can achieve the objectives of its designers. Thus Bucovetsky devotes an entire section to his argument that 'mobility makes income redistribution difficult'.

If an Ontario PIT were to diverge from other PIT structures, then some of those who would be hurt by the differences would leave Ontario rather than pay the extra taxes. Meanwhile, some of the taxpayers in

other provinces who would be aided by the differences would move to Ontario. The cost of products could be affected, and this would change the quantity and price of Ontario's exports and imports. Bucovetsky shows how these responses to tax differences could result in a tax incidence quite different from that expected at first glance. Even the price of housing could be affected. Bucovetsky notes that tax incidence may be altered through the political process: the groups hurt by provincial PIT differences can lobby to achieve treatment equal to that in other provinces. This possibility places another set of limitations on a provincial PIT.

The author turns finally to a survey of the empirical research on migration. These research studies do not directly concern themselves with the effects on mobility of interregional variations in PIT structure. Rather, they focus on differentials in gross wage rates. Bucovetsky feels that this does not limit their applicability, provided that differentials in net wage rates due to tax differences are expected to persist. The studies he cites support the theoretical arguments that a provincial PIT with significant differences from other PITs could lead to migration. In particular, 'mobility severely limits a province's ability to redistribute income among its residents.' In fact, if each province had its own PIT, competition to attract high-income residents through less progressive tax structures could reduce the overall progressivity of Canada's tax system. Bucovetsky also notes that Ontario's size and manufacturing base mean that an Ontario PIT could have an effect on relative incomes and product prices throughout the country.

Frank Flatters extends this analysis of the interprovincial impacts of an Ontario PIT to consider its implications for the Canadian common market. Ontario has supported the common market concept, and yet separate provincial PITs could interfere with that goal. In particular, provinces could use their PITs to compete with each other in attracting investment:

> While it might appear to be in the short-run political interest of a province to offer subsidies to new investments, the apparent gains from such activity would be diminished considerably by parallel behaviour by other provinces. The greater the interprovincial competition for such investments, the larger the subsidy would have to be in order to be successful and the smaller would be the apparent gains. Clearly, it would be in the interest of all provinces to agree to limit or even refrain from such protectionist policies.

Flatters feels that interprovincial competition would increase if each province had its own PIT. He argues that 'the independent behaviour of provincial governments in a decentralized federal system is almost certain to give rise to distortions in the interregional allocation of the nation's resources.' These distortions are undesirable in that they reduce economic output to below the nation's potential. Meanwhile, the provinces already have many instruments at their disposal to achieve provincial economic objectives and, he claims, 'most of these tools would be at least as effective as the personal income tax.'

Wayne Thirsk examines the goal of tax harmonization within a federal system. He considers the various types of fiscal harmonization that may be pursued in order to provide roughly equal treatment for all citizens and still leave room for diversity in accordance with unique provincial needs. Many economic variables are affected by taxes, and Thirsk analyses these relationships in the context of this discussion. In particular, he believes that 'the role of tax harmonization policies is to preserve expenditure diversity among sub-federal units of government while minimizing the distorting influence of the non-uniform revenue systems that these government may put in place.' Some tax differentials are likely to distort the allocation of resources more than others. If a province does institute its own PIT, it should be aware of these differences, which are important in any attempts to preserve harmonization. Thirsk discusses various means for achieving harmonization, such as tax separation, tax sharing, tax supplements, tax competition, and federal tax credits. He uses experiences of Australia, West Germany, and the United States to illustrate these processes, as well as tax developments in Canada. Thirsk concludes that 'speculation on the impact of a separate personal income tax in Ontario indicates that the potential for economic gain is highly problematic.' Prospects for retaliation by other provinces limit the gains from a separate PIT and illustrate the need for tax harmonization.

The final paper, by Richard Simeon, considers various political procedures that could facilitate the integration of federal and provincial economic policies so as to ensure the maintenance of the economic union. If the federal government and each provincial government wishes to act independently - for example, by adopting its own separate PIT - then perhaps some mechanism should be created to balance the various governments' respective interests and to police the common market and the agreements that underlie it. Independent and unco-ordinated legislation can

create barriers to movement of people, capital, and goods and services. Yet a unitary state is not the Canadian objective. In searching for an acceptable trade-off, Simeon poses three questions:

1 Should there be constitutional rules or provisions respecting the Canadian common market?
2 If so, how flexible or rigid should they be?
3 How should they be enforced or policed?

Simeon believes that the policing issue may be the most critical of the three. He examines three alternative policing methods: reliance on the judicial process, giving the policing power to the federal government, and the creation of a new federal-provincial committee. Simeon prefers making the eleven governments collectively responsible for preserving the common market. He believes that a new federal-provincial 'Committee on Economic Affairs' should be given

> the power, under the constitution, to formally overrule serious transgressions. Such a body could be a standing committee of a House of Provinces or Federal Council. Alternatively, the committee could be made responsible to the First Ministers' Conference, or it could even be given an independent existence.

The studies in this volume cast light upon the advantages and disadvantages of a separate PIT for Ontario. Furthermore, they examine many of the issues that a province must deal with if it does decide to establish its own PIT. It is hoped, then, that the volume provides useful and relevant commentary on an issue of major importance to the economic future of Ontarians.

The Personal Income Tax: Implications for Savings

Robin Boadway* and Neil Bruce**

INTRODUCTION AND SUMMARY

This paper discusses the effect of the personal income tax (PIT) on private saving and the implications of removing the double taxation of saving by moving from a tax based on comprehensive income to one based on expenditure or on labour income. The analysis, which is of a partial-equilibrium type, is carried out at the level of the household.

First, we discuss the motives underlying household saving. Although economists generally decompose household saving into life-cycle, bequest, and precautionary saving, we argue that all types of saving are motivated by two basic objectives - consumption smoothing and risk aversion. The latter leads to saving as a form of self-insurance in the event that insurance and/or capital markets are imperfect.

Next we examine the effects on savings of different types of personal income taxation, using a simple two-period model. We show that a PIT based on comprehensive income influences saving through a wealth effect and a substitution effect. The wealth effect reduces both saving and the rate of saving out of disposable income. The substitution effect reduces future consumption, but it may raise or lower private saving since saving represents 'expenditure' of future consumption. A tax based on labour income or expenditure has a wealth effect but no substitution effect.

We go on to identify the 'primary' and 'excess' burdens of the various types of PIT. The primary burden of labour-income and expenditure taxes equals the present value of the tax revenues collected. Since these taxes induce no substitution effects, they impose no excess burden. The com-

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prehensive tax causes the same primary burden but may also impose an 'excess' burden because of its distortion of household choice.

In the fourth section, we take a closer look at the substitution effect and its associated excess burden. The size of the effect depends on the PIT's effect on the after-tax real interest rate to savers and on the elasticity of substitution between present and future consumption. The former depends on the degree to which nominal interest rates are determined outside the economy (a degree that is presumably high for a small, open economy such as Ontario's) and, because capital income is not fully indexed, on the inflation rate. The elasticity of substitution depends on the tastes and age of the saver; the life-cycle model predicts it will be fairly high. We go on to show that even a low elasticity of saving to the after-tax real interest rate implies an elasticity of substitution of about unity between present and future consumption; thus, substitution effects cannot be ignored because of a low interest-elasticity of saving.

The sign and size of the excess burden are also considered. If the effect of the PIT on the labour-leisure choice is ignored, the excess burden of a comprehensive tax, compared to a labour-income or expenditure tax, is positive and could be sizeable. This result may, however, be modified by adding the labour-leisure distortion.

In the fifth part, we briefly survey empirical studies of saving behaviour. Early, poorly designed studies showed saving rates unaffected by interest rates. Recent studies of saving behaviour in the United States have revealed that real interest rates have a significant effect on saving. Canadian studies are very sparse; some find that tax incentives have no effect on saving, but we argue that the issue is still unresolved.

Next, we examine those provisions of the present Canadian PIT that permit the sheltering of a considerable amount of capital income. Because of these exemptions and deductions, the Canadian PIT has a mixture of expenditure, labour-income, and comprehensive-income bases with some features that belong to none of the three.

Finally, we ask whether Ontarians save too little, and, if so, whether changing the provincial PIT would improve matters. On the basis of our analysis, it seems unlikely that significant benefits would flow from such reform.

HOUSEHOLDS' MOTIVES FOR SAVING

To examine how the PIT impinges on private saving in Ontario, we begin by briefly surveying the motives underlying saving behaviour. Although households, firms, and governments all save, we shall concentrate on household or personal saving because it is the largest component of total saving and because households may perceive saving done by firms as occurring on their behalf (through capital gains in their assets that reflect retained earnings). Then they may - and apparently do - adjust their personal saving to get the desired total saving.

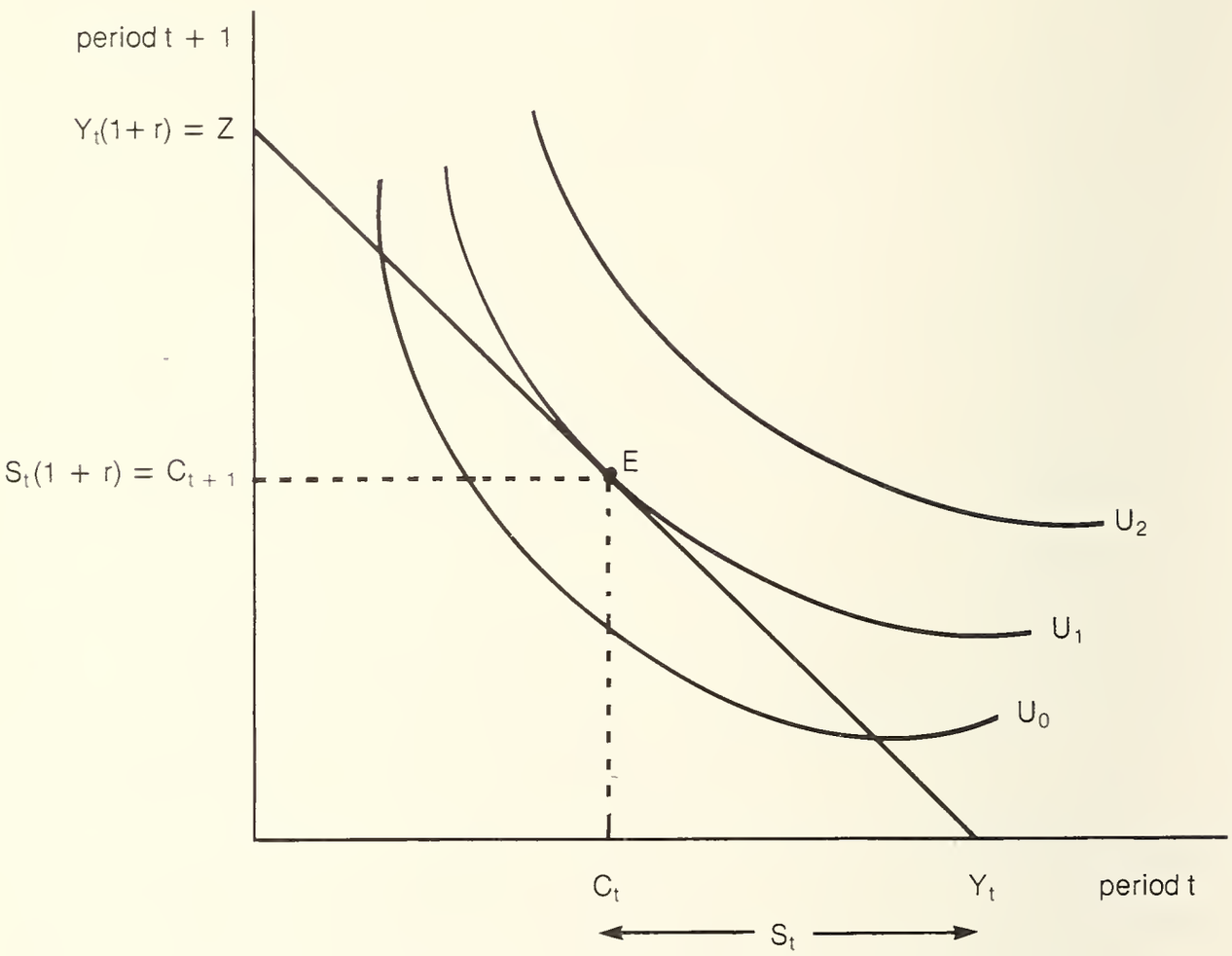
The household can use its current disposable income to consume goods and services now or to make current transfers to other households. Alternatively, it can save by using its current disposable income to acquire assets; by doing so, it can consume or make transfers in excess of its disposable income in future periods.

Economic theory casts light on this aspect of household choice by assuming that the household makes the consumption-saving decision rationally; that is, it attempts to maximize its lifetime utility. We argue that, at bottom, there are only two utility-yielding objectives: consumption smoothing and precaution.

In saving for consumption smoothing, the household seeks to offset the effects on consumption caused by temporal variations in income. If, as illustrated in Figure 1, the household receives income Y_t in period t but expects none in period t + 1, it will reasonably save some period-t income in order to consume in period t + 1. Point Y_t is the income endowment point, and Y_tZ the intertemporal budget line that shows the attainable combinations of consumption levels in the two periods. The slope of this budget line is -(1 + r) where r is the one-period net interest rate. The indifference curves are based on the assumptions that a household obtains utility from consumption in both periods and that there is a decreasing marginal rate of substitution between consumption in period t and consumption in period t + 1. The household maximizes utility at point E by saving enough current income to allow consumption in period t to equal consumption in period t + 1.

The second kind of saving, precautionary saving, results from concern that the household may incur unforeseen expenses in the future. If the household is unable to afford, say, unforeseen medical expenditures, it will suffer greatly. Consequently, it may save 'for a rainy day'.

Figure 1
Consumption - smoothing saving



Note that unforeseen expenses per se do not induce saving. The household may be able to purchase an insurance policy against such contingencies, or it may be able to borrow sufficient funds when and if such expenses occur. Precautionary saving occurs because market imperfections prevent the household from insuring against all contingencies and/or from borrowing against future labour income at the time the expenses occur. (Another reason for saving for unexpected expenditures is that the household prefers to finance them by forgoing consumption before and after they occur, even if it could borrow at the time. This behaviour is not precautionary saving but a particular case of consumption smoothing. By making this distinction, we emphasize that precautionary saving is carried on solely because of market imperfections.)

The consumption-smoothing and precautionary motives underlie three major theories of saving encountered in the literature. We will briefly examine them below:

- Life-cycle theory. This is the major theoretical framework for explaining household saving.[1] It starts with the idea that the typical household has a stream of earned income that varies over its life cycle. Income initially rises with age, levels off during the peak earning years, and then falls sharply with retirement. The household prefers a smoother stream of consumption than this income stream would permit. Therefore, it saves during its peak earning years to pay off borrowing undertaken in youth and to acquire a stock of assets to finance consumption in excess of income during retirement. Figure 2 shows the theoretical paths of income, consumption, and net financial wealth for a household that begins at age 0, retires at age R, and dies at age D. The diagram assumes that the household receives no inheritance and leaves no bequest and that its consumption rises, in textbook manner, over its life cycle (as its marginal rate of time discount, the absolute slope of its indifference curve at the point at which $C_t = C_{t+1}$, exceeds 1 + r). In reality, consumption usually falls at retirement, perhaps because of capital market imperfections and/or perhaps because leisure can be substituted for goods.

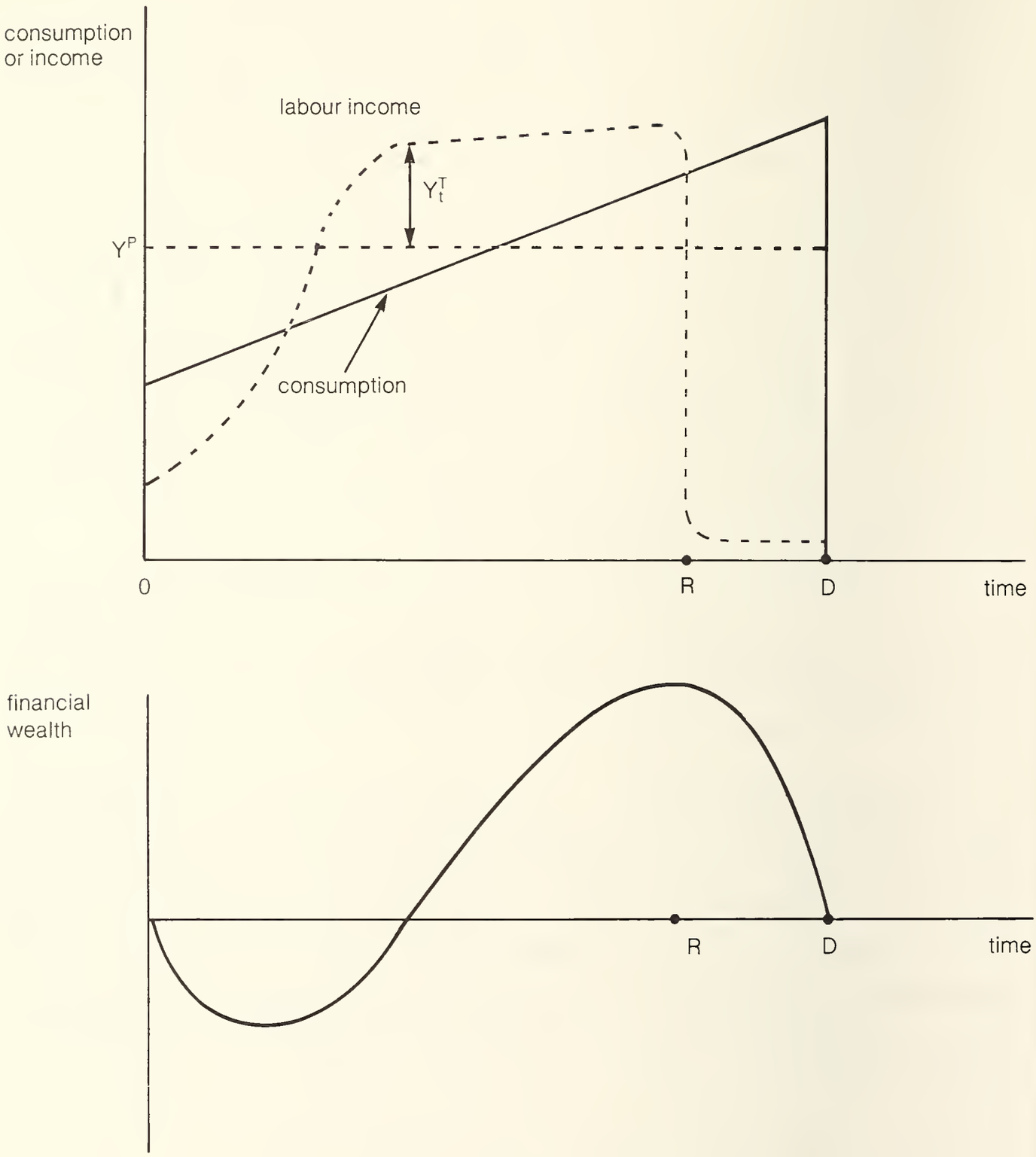
It is important to note that a household without bequests generates no net saving over its lifetime since it dis-saves all that it saves. A population of such households can, however, generate net savings if those in the saving phase of the life cycle are more numerous and/or more affluent than those in the dis-saving phase.

- Permanent-income theory. This theory of saving is essentially the same as the life-cycle theory, assuming the household has perfect certainty about its lifetime earning ability.[2] The household's lifetime capacity to consume is summarized by a single variable called its permanent income, Y^P. Its value is the level of income that, if earned every year of the household's lifetime, would permit the household to enjoy the consumption stream it actually purchases. Assuming the period-to-period real interest rate is a constant r,

$$Y^P = r[1 - (\frac{1}{1+r})^D]^{-1} \sum_{t=1}^{R} (\frac{1}{1+r})^t Y_t,$$

and t = 1, 2,...,R is the actual time stream of income to the household. The difference between current income, Y_t, and permanent income, Y^P, is called transitory income, Y_t^T, in Figure 2. According to the theory, any increment in Y_t^T is saved. In other words, the essence of the permanent

Figure 2
The life cycle of a typical household



income theory is that a household's permanent income, rather than its current income, determines its saving.

The permanent-income theory is particularly useful in analysing the saving decision of a household that is not certain of its future earning stream. Y^P_t is the permanent income the household expects, given the information available to it at time t. Any change is divided into a permanent component, which is saved according to the marginal propensity to save out of permanent income (the true underlying behavioural parameter), and a transitory component, which is totally saved.

- Bequest-saving theory. The life-cycle theory assumes that the household neither receives nor leaves a bequest; alternatively, it may receive a bequest and leave one equal to the value of its inheritance plus accrued interest. The bequest theory of saving, however, assumes that the household would like to leave its heirs a bequest larger (in terms of net present value) than it received. Thus, net saving over the life cycle of the household is not zero.

The theory's explanation for such behaviour is that households derive utility from the consumption of their heirs. We argue, however, that this desire per se need not lead to saving. Rather, it is the primary motives of consumption smoothing and precautionary saving that lead to saving for intergenerational transfers. To see this, consider the overlap of generations. It is long enough for intergenerational transfers to be made as continuous inter vivos gifts from the current income of the transferring generation. Saving occurs because the recipient generation chooses to save part of all of the transfers it receives and/or because the bequesting generation saves out of current income to make the desired transfers later in its life cycle or upon its demise. True bequest saving occurs only if the household wishes to leave something to a distant heir whose lifetime does not overlap its own (in which case some kind of 'trust' must be formed).

The recipient generation's motives for saving are clearly consumption smoothing and/or precautionary saving. It wants to hold some or all of the transfer so it can finance consumption, transfers, and/or unexpected expenses later in its life.

Consumption smoothing may also be the motive for the transferring household's saving. To obtain the wealth for transfer, it must reduce its own consumption. It may wish to spread this reduction over its entire lifetime, rather than over the much shorter period of overlap. Therefore,

it saves part of its income for eventual transfer to heirs.

The desire for consumption smoothing does not, however, explain why such a transfer often takes the form of a bequest at the end of a household's lifetime. The explanation here is the cautionary saving motive[3] plus the tax advantages of bequesting certain types of assets (e.g., owner-occupied homes and family farms). The transferring household does not know how long it will live. By holding on to the wealth to be transferred, it acquires a precautionary fund against the contingency that it will live too long and exhaust its life-cycle (non-bequest) wealth. Since, as we have shown, precautionary saving can arise only from a market imperfection, one must assume in this case that the market for annuities is imperfect or that the bequest method of self-financed annuity has tax advantages. (In fact, housing, which constitutes a major portion of bequest saving, does offer such tax advantages.)

THEORETICAL ASPECTS OF PERSONAL INCOME TAXATION AND SAVING

The PIT alters the household's consumption-saving choice in three ways. First, it removes purchasing power from the household, thus reducing its lifetime consumption opportunities; this change is called the wealth effect. Second, the PIT alters the relative prices of current and future consumption by altering the after-tax real interest rate; from this alteration rises the substitution effect. Finally, the PIT may alter total private saving by altering the distribution of income among households, which may differ in their marginal propensity to save, and also by altering the level of public saving. (The latter phenomenon affects private saving according to whether individuals perceive public saving as providing future purchasing power to the household - or perhaps to its heirs - in the same manner as private saving.) We call these effects the distribution effects.

Wealth, substitution, and distribution effects with various tax bases

In order to analyse and illustrate these effects, we shall consider three simple, proportional tax bases:

- a comprehensive base in which labour and interest income are taxed equally
- a labour-income base in which interest is exempt from tax

- an expenditure base in which the tax falls on the consumption expenditure of household income.

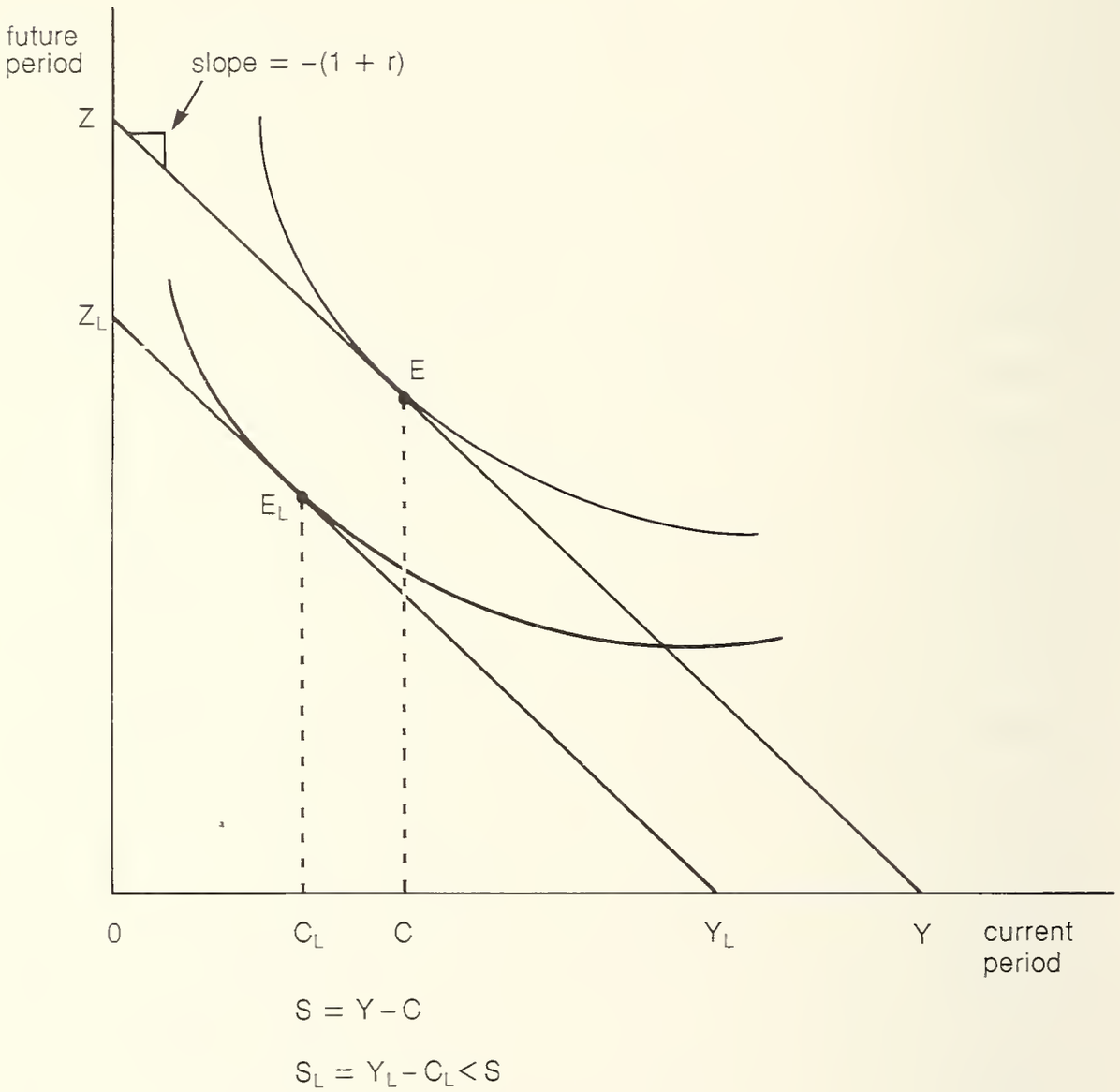
The comprehensive tax has both a wealth and a substitution effect, while the labour-income tax and the expenditure tax have only a wealth effect. Under certain circumstances, the latter two taxes are equivalent.

The wealth effect is illustrated in Figure 3, which shows labour income and consumption in the current period and in the future period. It is assumed that labour income, Y, is earned only in the current period; the household can allocate this income between present and future consumption according to budget line YZ, which has an absolute slope of 1 + r where r is the real interest rate. The household chooses present consumption C and saves Y - C. The labour-income tax reduces disposable labour income to Y_L but leaves the real interest rate unchanged. The household responds by reducing present consumption to C_L and future consumption to Z_L. Note that $(C - C_L) < (Y - Y_L)$, so saving falls. During the life cycle, the wealth effect reduces saving during earning years and reduces dis-saving in retirement years because the reduction in disposable income during the former occasions a reduction in consumption that is smaller but that occurs in all subsequent periods of the household's lifetime.

The comparative effects of a comprehensive-base tax are shown in Figure 4. The tax reduces disposable current income from Y to Y_C. Since interest income is now also subject to tax, the absolute slope of the budget line, $Y_C Z_C$, becomes 1 + r(1 - t) where t is the tax rate; the household chooses present-consumption level C_C. If, however, the comprehensive tax is replaced with a labour-income tax that collects the same present value of revenues, the household's budget line is $Y_L Z_L$. Although the two taxes have the same wealth effects, the labour-income tax leads the household to choose a higher future-consumption level and a lower current-consumption level. The difference between C_C and C_L is the substitution effect; it arises because the comprehensive tax lowers the after-tax real interest rate. The labour-income tax requires the household to forgo less current consumption to obtain a unit of future consumption - which is 1/(1 + r), compared with 1/(1 + r[1 - t]) under the comprehensive-based tax - so the household substitutes towards future consumption.

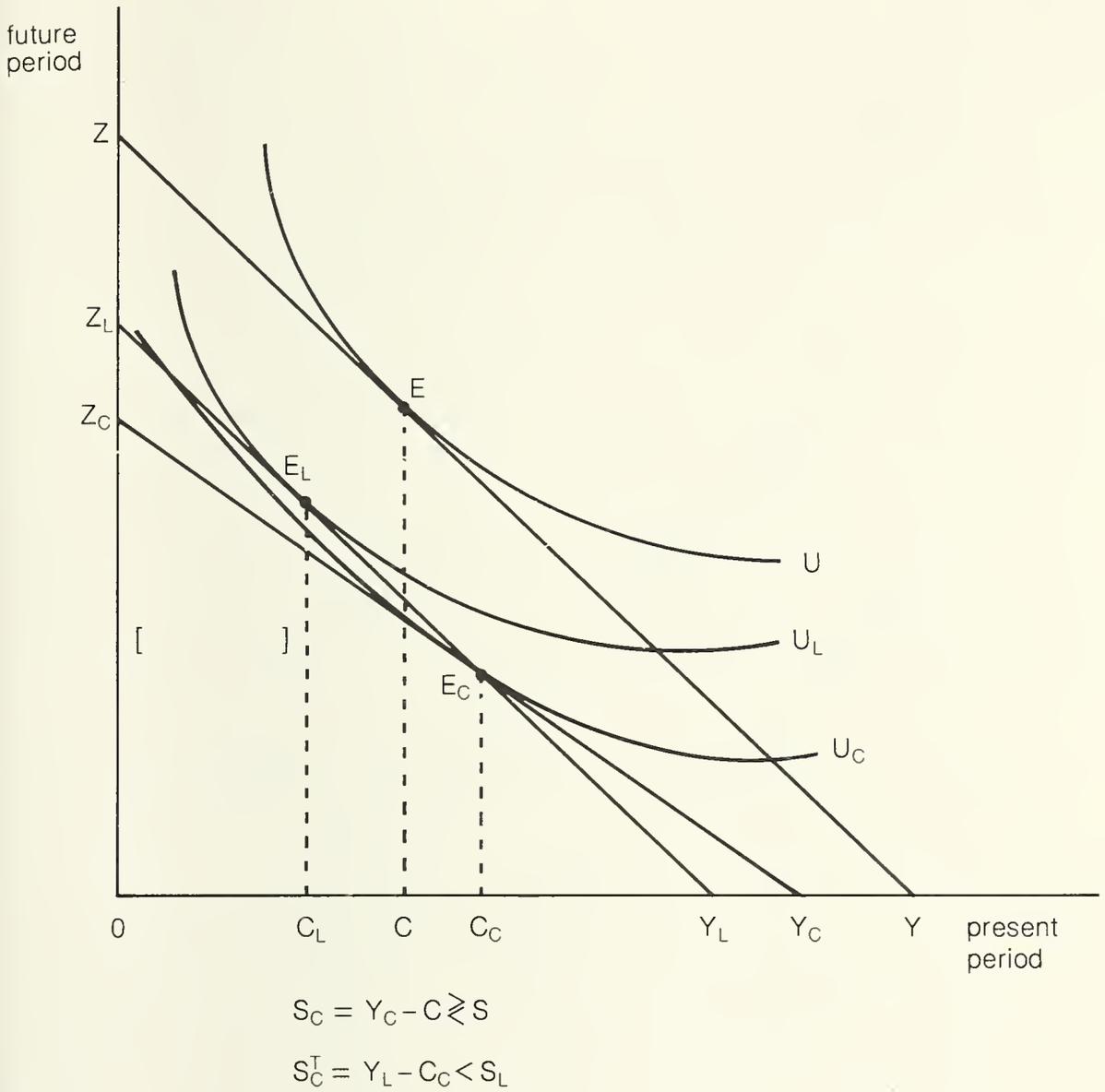
Two points should be noted. First, although the two taxes collect

Figure 3
Effect of a tax based on labour income



the same present value of revenues, the household reaches a lower utility level under the comprehensive tax; in other words, it carries an excess burden attributable to the distortion of the intertemporal consumption-allocation decision. Second, the substitution effect, even though it favours current consumption at the expense of future consumption, has an ambiguous effect on private saving; that is, $Y_C - C_C$ may be larger or smaller than $Y_L - C_L$. If, however, one assumes that the government spends the same amount in the current period under both tax bases, then public saving falls by $Y_C - Y_L$ under the comprehensive tax. Therefore, total saving, S_C^T (public saving plus private saving), must be smaller under the comprehensive tax than under the labour-income tax (in Figure

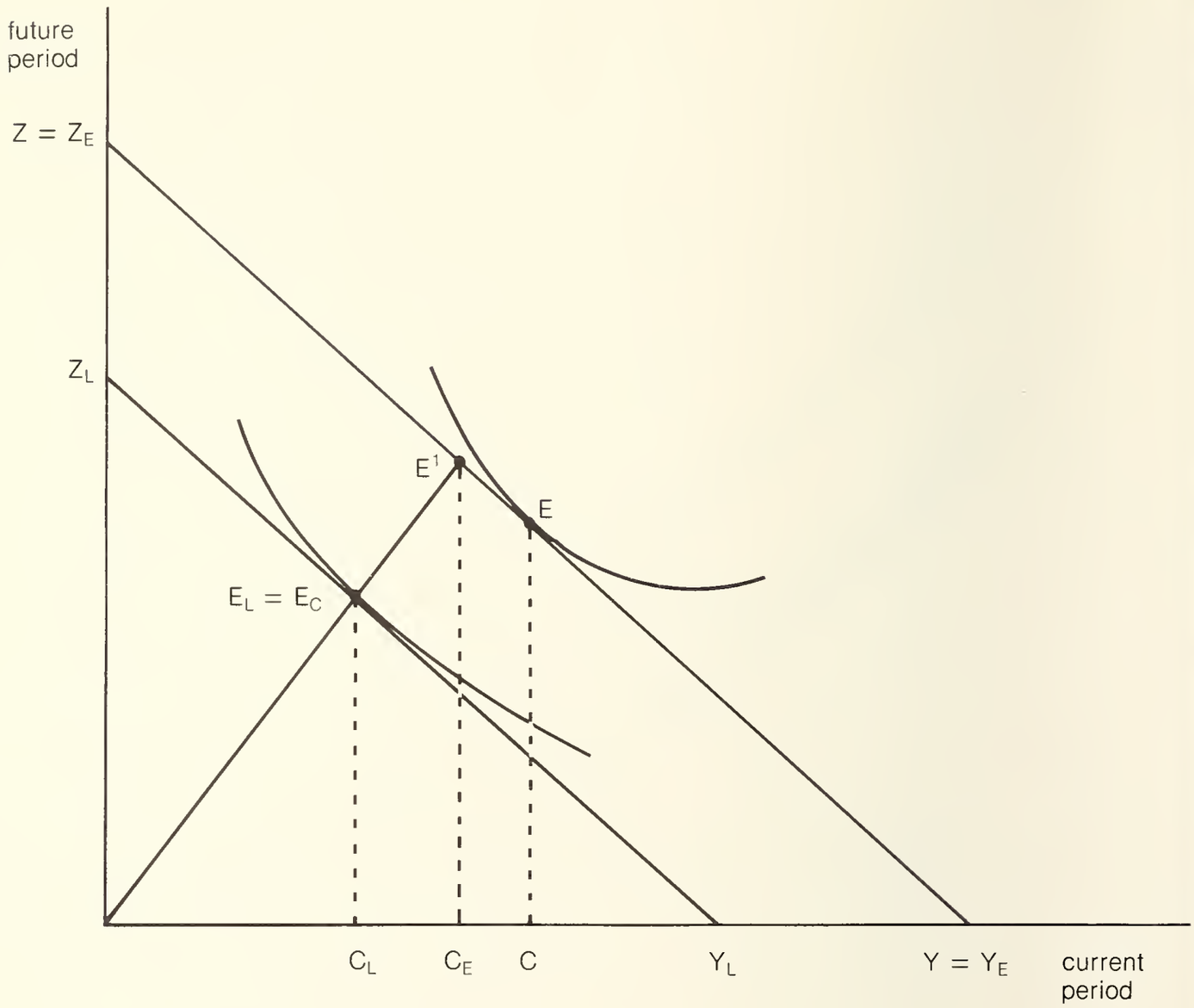
Figure 4
Comparative effects of a comprehensive income tax and a tax based on labour income



4, $Y_L - C_C$ compared to $Y_L - C_L$).

Figure 5 compares the effects of a labour-income and an expenditure tax. The household's budget line is the same under the two, but the time path of tax revenues differs. Under the expenditure tax, the gross-of-tax consumption expenditure is C_E, which may be greater or less than the no-tax consumption level, C; private saving is $Y - C_E$, which exceeds $Y_L - C_L$. If, however, the government spends the same amount in each period under both taxes, then moving from the labour-income to the expenditure base involves a reduction in government saving of $(Y - Y_L) - (C_E - C_L)$. Total saving is then $Y_L - C_L$, which is equal to private (and

Figure 5
Comparison of a labour-based and an expenditure-base tax



$S_E = Y - C_E > S_L$

$C_E \gtrless C$ so $S_E \lessgtr S$

$S_E^T = (Y - C_E) - [Y - Y_L - (C_E - C_L)]$

total) saving under the labour-income base. For this reason, labour-income and expenditure bases are equivalent if the taxes are proportional, if capital markets are perfect, if no bequests are made, and if government spending is unaffected by the choice of tax base.

The saving and dis-saving phases of the life cycle

The preceding analysis dealt largely with the effect of taxation on saving by a single household. The economy consists of many households, some in the saving phase of their life cycles and others in the dis-saving phase. Bequests aside, the lifetime saving of a household is zero; consequently, if the population consisted of an equal number of households in each phase of the life cycle, aggregate saving would be zero. But because the population and per capita incomes are growing and because net bequests are positive, the households in the saving phase dominate.

For this reason, it is worth noting that a change in the tax structure - say, one that removes the penalty against future consumption - would have its effects mainly on households in the saving phase. Those in the dis-saving phase would be largely unaffected because their intertemporal choices have, for the most part, already been made. This conclusion presumes that the change, say to an expenditure base, would not impose a wealth effect on the dis-saving households by taxing (again) expenditures made out of wealth accumulated under an income tax regime.

A CLOSER LOOK AT THE SUBSTITUTION EFFECT AND THE 'EXCESS BURDEN'

Assuming that contemplated tax reforms do not alter the present value of tax revenues or the time stream of government expenditures, the 'primary burden' and the wealth effects of the tax system are held constant. So we can focus our analysis on the substitution effect and its associated 'excess burden'. The size of the substitution effect depends on the change in the after-tax real rate of return to saving caused by the taxation of interest income and on the elasticity of the consumer's demand for present and future consumption.

The after-tax real rate of return

A comprehensive tax lowers the after-tax real interest rate. The magnitude of this effect depends on the openness of the economy and on the rate of inflation. If the economy is closed, the nominal (market) interest rate is endogenous, and general-equilibrium effects complicate the effect of the tax on the after-tax real interest. By definition, that rate ex ante is:

$$r = i(1 - t) - \pi ,$$

where i is the market interest rate, t is the tax rate on interest income, and π is the expected inflation rate.

According to the simple Fisher effect, i rises point for point with π. That is, $i = 1_0(t) + \pi$, where $i_0(t)$ is the hypothetical market interest rate with zero inflation and tax rate t. This gives us

$$r = i_0(t) - ti.$$

Ignoring the effect of t on i_0, we see that the higher is i, the more raising t will reduce r. And i, of course, rises with the inflation rate. Thus, in an inflating economy, the effect of a tax on interest income may reduce r by much more than the tax rate itself might indicate. This effect may, however, be offset partially if $i_0(t)$ rises with t, a situation possible in a closed economy.

According to the tax-adjusted Fisher effect, i rises by 1/(1 - t) for each point of inflation, leaving the after-tax real interest rate unaffected by inflation.[4] Then,

$$r = i_0(t)(1 - t).$$

Notice that t still reduces r, but by less than under the simple Fisher effect. Again, in a closed economy, $i_0(t)$ might rise with t, partially offsetting the reduction in r.

Ontario is, however, an open economy, and its domestic interest rates are strongly influenced by interest rates abroad. Outsiders will lend in Ontario only if they can earn here the same after-tax real rate of return they would receive elsewhere. That rate is

$$r^* = i^*(1 - t^*) - \pi^*,$$

where the asterisk denotes the value of the variable elsewhere.

The nominal gross-of-tax rate of return to the non-resident who lends in Ontario is

$$i - \left(\frac{e^f - e}{e}\right) ,$$

where e (e^f) is the spot (forward) domestic currency price of a unit of foreign exchange. (Obviously, if the lender is a resident of another

Canadian province, $[e^f - e]/e = 0$.) Assuming, for simplicity, that the gains or losses on foreign-exchange transactions are taxed or deducted at the same rate as interest, the net-of-tax real return to outsiders lending in Ontario is

$$\hat{r}^* = (i - \frac{e^f - e}{e})(1 - \hat{t}) - \pi^*,$$

where $\hat{t}$ is the tax rate the outsider faces on Ontario earnings.

For the non-resident to lend in Ontario, $\hat{r} = r^*$, where r^* is exogenous to Ontario, so

$$i = \frac{r^* + \pi^*}{1 - \hat{t}} + \frac{e^f - e}{e} .$$

The net-of-tax real return to a resident is

$$r = i(1 - t) - \pi$$

$$= (\frac{r^* + \pi^*}{1 - \hat{t}})(1 - t) + (\frac{e^f - e}{e})(1 - t) - \pi.$$

For simplicity, assume that purchasing power parity holds, so $(e^f - e)/e = \pi - \pi^*$. Thus,

$$r = (r^* + \hat{t}\,\pi^*)(\frac{1 - t}{1 - \hat{t}}) - t\pi.$$

Under tax treaties, however, the authorities in the jurisdiction in which the saver is resident impose the tax on capital income, except for a small withholding tax. The jurisdiction in which the income originates levies this withholding tax, but it is credited against taxes due in the lender's own jurisdiction. Thus, $\hat{t} = t^*$. So the Ontario tax rate is irrelevant in determining the rate of return available here to non-residents. In this case,

$$r = (\frac{r^* + t^*\pi^*}{1 - t^*})(1 - t) - t\pi.$$

All the variables with asterisks are exogenous so, clearly, if $\pi = 0$, the

after-tax return to Ontario savers falls in proportion to any rise in t. But if $\pi > 0$, the after-tax real return falls more than t rises. This assumption is the one we adopt in this report.

Fried and Howitt (1980) treat the after-tax real return to domestic savers as pegged by international capital mobility. This assumption would be reasonable only if Ontario's withholding tax on interest income is above the other jurisdiction's rate - that is, if $t > t^*$, so $\hat{t} = t$. In that case, the gross-of-tax return must adjust so that non-resident lenders receive their required after-tax real return, and

$$r = r^* + t(\pi^* - \pi).$$

In this situation, r rises with, remains the same, or falls with t depending on whether the foreign inflation rate exceeds, equals, or is less than the domestic inflation rate.

Substitution between present and future consumption

We can now consider the effect of taxation on saving. The way in which changes in the after-tax real rate of return, derived above, affect saving depends on the elasticity of substitution between present and future consumption. In particular,

$$\eta_{sr} = \varepsilon - 1,$$

where η_{sr} is the elasticity of saving with respect to the real interest rate and ε is the elasticity of substitution between present and future consumption.[5] Note that if $\varepsilon = 1$ (which will occur if the utility function is of the Cobb-Douglas form), then $\eta_{sr} = 0$. In this case, the after-tax real rate of return does not affect saving (or the rate of saving out of disposable income). The household's choice between present and future consumption may, however, be affected.

Summers (1981) argues that the two-period single-household model may be misleading in regard to the effect on saving of the changes in the real interest rate. He derives the saving function from a continuous life-cycle model that includes overlapping generations and finds, for reasonable estimates of the relevant parameters, very large values of η_{sr} - in the order of 3. The reason is that a change in the real interest rate has a substantial wealth effect on working (and saving) generations in the

life-cycle model because that is the rate at which households discount future income. The longer the household's time horizon, the greater the value of η_{sr}. Thus, a household that cares about its heirs and extends its planning horizon increases its elasticity of saving with respect to the real interest rate. The elasticity becomes infinite (i.e., the savings function becomes perfectly elastic) for a household with an infinite horizon.

Summers also argues that in the overlapping-generations model the transition effects of a labour-income tax are quite different from those of an expenditure tax. This difference arises because an expenditure tax strikes the retired (dis-saving) generation more heavily. However, his implicit assumption is that the tax is levied on expenditures made from assets acquired prior to the imposition of the expenditure tax. Yet if the earnings used to acquire these assets had been subject to an income tax with a comprehensive base, there is no reason to tax dis-saving from them.

The 'excess burden' attributable to a comprehensive tax's substitution effect can be quantified using consumer's surplus triangles.[6] Feldstein (1978b) shows that if one ignores the labour-leisure distortion, the excess burden, WC, is approximated by

$$WC = \frac{1}{2} S(1 - \sigma + \frac{\eta_{sr}}{r_t T})(\frac{e^{-r_t T} - e^{-r_0 T}}{e^{-r_t T}})^2,$$

where S is current after-tax saving, σ is the marginal propensity to save, T is the average holding period of saving, r_t is the after-tax real rate of interest with tax rate t, and r_0 is the real rate of interest with no taxes.

This equation can be evaluated for hypothetical values of the parameters. Note that even if $\eta_{sr} = 0$ (i.e., if the saving rate is insensitive to the after-tax real interest rate), WC may be high. For example, if we take $r_t = 0.005$, $r_0 = 0.04$, T = 20 years, S = \$25 billion, $\sigma = 0.1$ and $\eta_{sr} = 0$, we obtain an excess burden of approximately \$3.5 billion a year in Canada. And as we increase η_{sr}, the excess burden increases rapidly; if we use Boskin's estimate (see the next section) of $\eta_{sr} = 0.4$, we obtain a figure of more than \$18 billion. Assuming Ontarian saving is about \$8 billion, the province's share of the excess burden of the comprehensive tax is between \$1.2 billion and \$6 billion.

The labour-leisure distortion

Notice, however, that the previous calculation of the excess burden includes the assumption that we can ignore the labour-leisure distortion. In reality, we cannot. A PIT of any kind favours leisure and other non-market transactions as a source of household utility and so distorts the household's decision to supply labour. Since early retirement is a primary means of consuming more leisure, both types of taxes may induce households to retire from productive activities sooner than is socially optimal. Applying a higher tax to future consumption may reduce this welfare cost. By taxing saving, the comprehensive tax makes it necessary to save more out of a given income in order to retire early and may thereby reduce the incentive to retire too early. If it does, the excess burden it imposes could conceivably be smaller than that imposed by a labour-income or an expenditure tax. However, Feldstein (1978a, S48) argues, on the basis of stylized facts, that the excess burden is unlikely to be the case and that removing the double taxation of saving would lead to sizeable welfare gains.

Support for this idea comes from an a priori argument by King (1980), who considers a system comprising a tax based on interest income, t_r, and a tax based on labour income, t. He analyses the optimal tax structure in an economy in which both the consumption-saving and the labour-leisure choices are affected and shows that in the special case of a Cobb-Douglas utility function, the consumption tax (i.e., $t_r = 0$) is optimal. This finding is just an example of optimal piecemeal policy (see Boadway and Harris [1977]). Since the Cobb-Douglas utility function implies a constant saving rate and since some empirical studies of saving behaviour find a constant saving rate, this result is of considerable interest.

Summary

In summary, the effect of removing the double taxation of saving by means of a tax based on labour income or on expenditure is likely to depend on the substitution effect. Thus, the important questions are the degree to which the tax reduces the after-tax real interest rate and the sensitivity of the household's choice between present and future consumption. The larger these effects, the greater the excess burden attributable to the double taxation of saving.

EMPIRICAL STUDIES OF SAVING BEHAVIOUR

The empirical evidence on the effects of taxation (and other variables) on saving is inconclusive at best. Early studies of Keynesian consumption functions often failed to include the interest rate as an independent variable, probably because of a general presumption that the saving rate was insensitive to interest rates. Studies that did include the interest rate often used the gross-of-tax nominal rate rather than the after-tax real rate (although theory predicts that the latter is the appropriate variable). Feldstein (1970) argues that this specification of the savings function systematically biases downwards the estimated interest-rate elasticity of saving.

Several empirical studies have, however, followed theory more closely. Their findings are interesting, although not always comparable and sometimes contradictory.

US studies

Perhaps the most careful of the work that shows saving rates to be independent of the after-tax real return on saving is that of Denison (1958), which was extended by David and Scadding (1974). These studies indicate that gross private saving as a fraction of gross national product has remained essentially constant over the past fifty years. Unlike many researchers, David and Scadding were careful to consider all types of private saving (by households and by firms) and to define savings carefully (e.g., they count as a form of saving expenditure on consumer durables, and they add to national income the consumption streams generated by such durables). The results of the Denison and the David and Scadding studies imply perceptive behaviour on the part of savers. Any changes in saving by firms is recognized by households, who then adjust their own savings by an equal and opposite amount. In addition, the studies imply, households treat taxes as equivalent to current consumption.

Recently, Boskin (1978) estimated various forms of the savings function and found a large and significant interest-rate elasticity of saving, ranging from 0.2 to 0.6 and clustering in the 0.3 to 0.4 interval. Boskin finds the results of the Denison and David and Scadding studies questionable. Saving should be measured net of depreciation, he argues,

rather than gross as David and Scadding measured it. In addition, Boskin uses disposable income, rather than GNP, as the scale variable and carefully constructs a series on the real after-tax return to saving. Using numerous specifications and OLS and instrumental variables estimation, he finds interest-saving elasticities that are large and positive, though they are partial since he holds real wealth (and other variables) constant. Recall that Summers' life-cycle model also implies positive elasticities, although larger ones. The difference in size is attributable to the fact that Summers includes substitution and wealth effects. In fact, Summers (1981) finds that, after adjusting for wealth effects, the life-cycle model implies elasticities of the same order as Boskin's estimates.

In contrast, a recent study by von Furstenberg (1981) finds negative elasticities between private saving (and saving rates) and the real after-tax return on saving. Since von Furstenberg's specifications and procedures are quite different from Boskin's, it is difficult to compare the studies. Von Furstenberg's main thrust is an examination of the interrelationships among household, corporate, and government saving. Like other researchers, he finds that household and corporate saving appear to be perfect substitutes for each other. He does not, however, discover that households always treat taxes as government expenditures. Rather, he finds that taxes are treated as substitutes for private saving only if they are expected to increase public saving. To the extent that households act this way, tax increases have a strong negative effect on private saving.

Canadian studies

Canadian studies of saving have not been as comprehensive as those done in the United States. In their estimation of Canadian saving functions, Davidson and MacKinnon (1981) do not include the after-tax real interest rate, although they do adjust the definition of private saving and income for inflationary distortions.[7] They find that Canadian saving rates substantially exceeded those in the US during the 1970s and suggest that the difference may be attributable to tax incentives to save introduced in Canada during the period.

Wirick (1981) examines Canadian saving behaviour and finds total private saving negatively related to saving in RRSPs. He concludes that the differences between US and Canadian saving rates reflect different

movements in transitory income rather than different tax incentives. During the 1970s, transitory income (measured as the deviation from trend income) rose substantially in Canada but fell in the US. Since transitory income is largely saved, this difference could explain the divergence in the US and Canadian saving rates.

Wirick includes the after-tax real interest rate as an independent variables and finds a coefficient of the expected sign but of marginal significance. This finding, along with the negative coefficient on RRSP saving, leads him to conclude that tax incentives are an unlikely explanation for Canadian saving rates' rising relative to those of the US. This negative conclusion must be hedged, however, because Wirick's use of RRSP saving as an independent variable in his econometric estimation is questionable.

At the moment, 'not proven' is the best verdict one can base on the empirical evidence of the effects of tax incentives on saving, although it remains plausible that they have elevated Canadian saving rates relative to US rates. The RRSP tax incentive basically switches the PIT towards an expenditure base, and that move, as we have seen, could raise or lower private saving.

It is also worth noting that the Canadian and the US total saving rates (i.e., combined public and private saving rates) did not diverge as much as the two countries' private saving rates because in Canada the public-sector deficit is a larger proportion of GNP than it is in the US.

THE CURRENT PIT AND SAVING

Nominally, Canada's present PIT system uses a comprehensive base, but it actually has a mixture of the three bases we have considered: the comprehensive base, the labour-income (or capital-income-exempt) base, and the expenditure base. This section summarizes the system's relevant provisions and their effects.

Provisions moving the PIT towards a labour-income base

A number of provisions in Canada's existing PIT system are moving it towards a labour-income or capital-income-exempt base. The first $1,000 of aggregated interest, dividends, and taxable capital gains are exempt from taxation. Capital gains are taxed only when realized and then at

one-half the full tax rate. Dividends from Canadian corporations are eligible for a tax credit of approximately 50 per cent. Several kinds of interest income - from Canada Savings Bonds, from Guaranteed Investment Certificates, and, until November 1981, from income-averaging annuity contracts and whole life insurance policies - are taxed when realized rather than when accrued; thus, the recipient has the option of lowering the effective tax rate on this capital income by postponing realization. Equity in owner-occupied housing also affords tax-exempt capital income since neither the implicit interest on the owner's equity nor the real capital gains on the value of the property is subject to tax.

Although these provisions move the PIT towards a labour-income tax, it must be recognized that some of them are actually rough attempts to undo features of the total tax system that would otherwise impose a larger tax rate on capital income than on labour income. For example, the partial taxation of capital gains and the dividend tax credit are designed to refund that part of the corporate income tax (CIT) that falls on equity income because the opportunity cost of equity finance is not deductible from the firm's CIT.

More importantly, the phenomenon of substantial expected inflation severely distorts the conventional measure of capital income since the erosion of the real value of assets due to inflation is not counted as a capital loss.[8] Rather the PIT's definition of capital income includes nominal capital gains on equities and real assets and the inflation premium on interest rates. To the extent that such spurious components are deducted elsewhere (e.g., a firm can deduct nominal interest payments), the net effect may be small, but in many cases no offsetting deduction is available. The most serious distortions here arise from the taxation of nominal capital gains on equities and other real assets and from the non-deductibility of interest on mortgages on owner-occupied housing. The tax system favours home ownership that is equity financed, but it imposes a major inflation tax on home ownership that is mortgage financed: the inflation premium in mortgage interest rates is taxable to the creditor but is not deductible for the debtor.

More generally, interest payments and capital losses are deductible only against the taxpayer's current capital income, so some taxpayers can take advantage of the deductions and others cannot. This lack of symmetric treatment creates another way in which the current PIT taxes some types of capital income more heavily than would occur under a true comprehensive base.

Provisions moving the PIT towards an expenditure base

Moving the present PIT system towards an expenditure base are a number of other provisions that involve deducting from taxable income a saving of some sort and imposing the tax when the proceeds are removed from saving later on. The main examples are contributions to and payments from Registered Retirement Savings Plans (RRSPs), Registered Pension Plans (RPPs) the Canada (or Quebec) Pension Plan (CPP), and Registered Home Ownership Savings Plans (RHOSPs) that are not used to purchase homes.

In addition to partially converting the PIT to an expenditure base, these schemes permit individuals to average taxable income over a period of more than one year, a subject we return to later.

Provisions with other effects

Some provisions of the current PIT act in a manner unlike any of the taxes we have considered. Some exempt income from any tax. For example, the funds from a RHOSP that are used to acquire equity in a home escape taxation altogether. (And as we have noted, the tax system already favours equity in a home.) Also permitted is a $1,000 pension-income deduction; since such income is mostly derived from tax-sheltered saving, this provision affords some completely tax-free income.

In some cases, the PIT also impinges on capital income generated at source. Unincorporated businesses provide an example. Equity income from such a source is taxed at personal tax rates, but the true real capital costs of earning that income are not deducted; for this reason, the PIT treats such capital income differently from labour income. Another example is the taxation of income from owner-occupied housing, which we have dealt with already. Before November 1981, a third example was the MURB scheme, which permitted special tax write-offs for rental income from certain multiunit residential properties.

Another type of investment directly affected by the PIT is investment in human capital - education, skills, health, and so on. Since the costs of this kind of capital are mostly forgone income, the PIT effectively permits their immediate write-off. An individual's income may, however, be insufficient to permit deduction of pecuniary costs, even though they are actually deductible. Also, a progressive tax structure provides a dis-

incentive to investing in human capital because the deductions for it fall in periods of low tax rates while the resultant earnings are taxed at a much higher rate. This disincentive reflects the inadequate averaging provisions of the PIT.

Averaging deserves some further mention. The Canadian tax system differs from the systems we considered in theory because it is progressive. This progressivity introduces biases when income fluctuates or when there is inflation in the absence of complete indexing of the rate structure. Before November 1981, the tax system afforded general averaging in addition to the self-averaging that could be arranged through RRSPs and, at the time, through income averaging annuity contracts (IAACs). Also, before May 1982, the rate structure was adequately indexed (although the limits on the provisions relating to capital income were not). Current regulations, however, permit only a limited form of forward averaging, and only a partial indexation of the rate structure is to be implemented for the 1983 to 1984 period.

Effects of the various provisions

The upshot is that the effective tax rate depends on the variability of the tax base and on the inflation rate. A constant base is subject to a lower average tax rate than is a variable base with the same average base. Since income is more variable then consumption, the PIT's inadquate averaging provisions tend to make the comprehensive base more disadvantageous to saving in practice than it is in theory. Also, a progressive labour-income tax is not equivalent to a progressive expenditure tax. Neither is neutral with respect to the household's saving decision; either may cause saving to rise or to fall.

The overall effect on saving of the various provisions is uncertain. It seems clear that for individuals who have less than $1,000 investment income and/or save less than the prescribed RRSP limits, the PIT is much like a tax based on expenditure or labour income; it has a wealth effect but no substitution effect on saving. (This statement is not quite true because of the progressivity of the tax.) For individuals with more than $1,000 investment income and/or annual savings in excess of the limits permitted for RRSPs, the PIT acts as a comprehensive tax at the margin with the previously described wealth and substitution effects on saving; any benefits such taxpayers derive from the various shelter provisions are

lump-sum benefits. In between are individuals who save partly in sheltered assets and partly in taxable assets because the former are less liquid and, therefore, less useful for precautionary saving.

IS ONTARIO SAVING TOO LITTLE?

The basic policy questions are whether the level of saving in Ontario is too low and, if so, whether the problem can be alleviated by changes in the provincial component of the PIT. A concern with saving rates is often expressed but rarely justified. In some cases, concern expressed in Canada simply echoes concerns being expressed in the United States (e.g., Feldstein [1977]), which may or may not be relevant to Canada.

The concern in the US was initiated by a sharp fall in that country's private saving rate during the 1970s. It was argued that these low saving rates would lead to reduced capital formation, which, in turn, would stifle growth, reduce labour's share of income, and reduce international competitiveness. In addition, ran the argument, the reduction in saving rates induced by tax distortions and public pension plans would reduce household welfare below what could otherwise be attained.

On the surface, it seems odd that concerns about deficient saving should also be expressed in Ontario. Recent measured saving rates in Canada are high by historical standards and in comparison to those of other developed economies. Moreover, in interprovincial comparisons, Ontario's saving rate is one of the highest.

Nevertheless, the question of the level of saving is worth looking at. As Jump (1980) and Davidson and MacKinnon (1981) show, conventional measures of saving in an inflating economy seriously overstate private saving rates. When adjusted for the distortions of inflation, the recent Canadian household saving rates are in the order of 6 to 7 per cent rather than the unadjusted rates of 10 to 11 per cent (see Davidson and MacKinnon 1981, 22). Moreover, government dis-saving in Canada has been greater than in the US (although the magnitude has been biased upwards by inflation). Finally, dis-saving in the form of depleting resources is greater in Canada than the US, although such dis-saving is never counted as such.

Despite these adjustments, the Canadian saving rate has not shown a significant downward shift as the US rate has. Thus, any concern about the Canadian rate must be based on the presumption that it should be

higher than it is, rather than on an observed decline. Since more saving requires less current consumption, an assertion that saving should be encouraged needs to be supported with good reasons. Four possible reasons are:

- Higher saving yields higher investment, which is important for growth. This statement is questionable. First, it is necessary to demonstrate that investment is too low. More importantly, saving and investment decisions are distinct in an open economy, such as Ontario's. If Ontario saving is insufficient to finance all profitable Ontario investments, financial resources from outside the province can be used.

- Domestic saving is desirable because it reduces the need for outside financing. This view presumes that foreign financing is socially undesirable. There may be valid reasons for avoiding undue reliance on direct foreign investment (though most economists find these reasons unconvincing), but no strong arguments have been advanced against portfolio (bond and non-controlling equity) financing from abroad.

- Pay-as-you-earn pension plans have reduced private saving without replacing it with public saving. This claim has been made by a number of authors (notably Feldstein [1974]) in the US. As we show in another study in this volume, the provisions of Canada's public pension schemes make such a reduction theoretically possible in this country, though empirical evidence gives little sign of its having occurred.

- The taxation of capital income, magnified by inflation distortions, has severely reduced the after-tax real return on saving, thereby inducing households to save less than is socially optimal. For many Canadian economists, this is the basic case for reforms of the PIT with respect to saving. Yet the problem is less in Canada than in the US because, as we have seen, the Canadian tax system has many provisions that move the PIT towards an expenditure and a labour-income base. In these cases, the PIT does not reduce the after-tax real return to savers. In fact, for sheltered saving (in RPPs, RRSPs, and RHOSPs) and for unsheltered investments yielding less than $1,000 annually, the real interest rate in Canada has been very high during the past five years. Moreover, although increasing the after-tax real return on saving would raise future consumption, doing so might raise or lower private saving since private saving is an expenditure on future consumption.

Conclusions

In other words, the real question is not whether there is too little saving but whether the remaining disincentives to future consumption should be removed from the provincial share of the PIT. The answer to this question is unknown, but we make the following observations.

- Although the present PIT may discourage unsheltered saving (by reducing after-tax returns), it encourages saving by favouring early retirement (leisure) over working. It is uncertain whether welfare gains would result from making the provincial PIT entirely expenditure based.

- Even if changes would bring welfare gains, they would likely be small since an Ontarian PIT could undo the tax only on the provincial share (about one-third) of the saving that is unsheltered (say, one-half of all saving). This amounts to one-sixth of Ontario's saving and, therefore, one-sixth of the excess burden that is calculated hypothetically, assuming all Ontario saving is 'double taxed'. Since Ontario saving is probably between $1.2 and $6 billion (depending on the saving elasticity assumed), the welfare gain from reforming the provincial PIT would be between $0.2 and $1 billion at most.

NOTES

1 The seminal article on the life-cycle theory is Ando and Modigliani (1963). Recent examinations include Summers (1981).

2 The permanent-income theory was originally put forward by Friedman (1957).

3 The following discussion is based, in part, on Davies (1981).

4 For a discussion of the Fisher effect and the tax-adjusted Fisher effect, see Feldstein (1976) and Tanzi (1976).

5 See Feldstein (1978b).

6 Some studies have erroneously assumed that the appropriate welfare triangle is the one formed by the before- and after-interest rates and the savings function (e.g., see Wright [1969]). This assumption is quite incorrect, as Feldstein [1978a, 1978b] and the following discussion make clear.

7 See Jump (1980) for details on how inflation distorts measured private saving.

8 Similarly, capital gains resulting from inflation-induced erosion of nominal liabilities are not taxes. However, the consolidated private sector is a net creditor (against the public sector), so there is an inflation tax on net.

REFERENCES

Ando, A., and F. Modigliani (1963) 'The "life cycle" hypothesis of saving: aggregate implications and tests.' American Economic Review 53, 55

Beach, C.M., with D.E. Card and F. Flatters (1981) Distribution of Income and Wealth in Ontario: Theory and Evidence (Toronto: Ontario Economic Council)

Boadway, R., and R. Harris (1977) 'A characterization of piecemeal second best policy.' Journal of Public Economics 8, 169-90

Boskin, M.J. (1978) 'Taxation, saving and the rate of interest.' Journal of Political Economy 86, 3-28

David P., and J.L. Scadding (1974) 'Private saving: ultrarationality, aggregation and "Denison's Law".' Journal of Political Economy 82, 225-49

Davidson, R., and J.G. MacKinnon (1981) 'Inflation and the savings rate.' Queen's University Institute for Economic Research Discussion Paper no. 351

Davies, J.B. (1981) 'Uncertain lifetime, consumption and dissaving in retirement.' Journal of Political Economy 89, 561

Denison, E.F. (1958) 'A note on private saving.' Review of Economics and Statistics 40, 261-7

Feldstein, M.S. (1970) 'Inflation, specification bias and the impact of interest rates.' Journal of Political Economy 78, 1325-39

- (1974) 'Social security, induced retirement and aggregate capital accumulation.' Journal of Political Economy 82, 905

- (1976) 'Inflation, income taxes and the rate of interest: a theoretical appraisal.' American Economic Review 66, 809-20

- (1977) 'Does the United States save too little?' American Economic Review, Papers and Proceedings 67, 116

- (1978a) 'Reply.' In Robert Barro, ed., The Impact of Social Security on Private Saving: Evidence from U.S.. Time Series (Washington: American Enterprise Institute for Public Policy Research), pp. 37-47

- (1978b) 'The welfare cost of capital income taxation.' Journal of Political Economy 86, 29-53

Fried, J., and P. Howitt (1980) Pensions in a General Equilibrium Model of Canada. Economic Council of Canada Discussion Paper no. 168 (Ottawa)

Friedman, M. (1957) A Theory of the Consumption Function (Princeton,

N.J.: Princeton University Press)

Jump, G.V. (1980) 'Interest rates, inflation expectations, and spurious elements in measured real income and saving.' American Economic Review 70, 990-1004

King, M.A. (1980) 'Savings and taxation.' In G. Hughes and G. Heal, eds., Essays in Public Policy (London: Allen and Unwin)

Summers, L.H. (1981) 'Capital taxation and accumulation in a life cycle growth model.' American Economic Review 71, 533-44

Tanzi, V. (1976) 'Inflation, indexation and interest income taxation.' Banco Nazionale del Lavoro Quarterly Review 116, 64-76

von Furstenberg, G.M. (1981) 'Saving.' In H. Aaron and J.A. Pechman, eds., How Taxes Affect Economic Behavior (Washington, D.C.: Brookings Institution)

Wirick, R. (1981) 'Paradoxes in recent Canadian-American personal savings behaviour,' University of Western Ontario. Manuscript

Wright, C. (1969) 'Saving and the rate of interest.' In A.C. Harberger and M.J. Bailey, eds., The Taxation of Income from Capital (Washington: Brookings Institution)

The Personal Income Tax: Implications for Pensions

Robin Boadway* and Neil Bruce**

INTRODUCTION

For the typical individual or household, the income and consumption streams differ over the life cycle: income accrues heavily in the working years and drops at retirement, but consumption must be provided for throughout the cycle. Pension schemes, public and private, are one way of smoothing the income stream into a lifetime consumption stream.

The personal income tax's (PIT's) treatment of pensions tends to smooth tax payments over the lifetime as well. This treatment raises a number of substantial issues for taxation:

- Such a smoothing of the stream of tax payments is a form of income averaging over the life cycle, one that can be viewed as being desirable on equity grounds. A natural question, therefore, is whether the existing tax treatment of pensions gives rise to the optimal degree of averaging.

- A related issue rises from the fact that some kinds of pension schemes serve to move the tax system away from a comprehensive-income base, towards an expenditure base. This fact has both efficiency and equity implications for tax policy.

- The use of pensions as averaging devices and their implicit role as instruments of expenditure taxation are interwoven. If policymakers prefer income-based taxation but also want to maintain lifetime averaging, the PIT's present treatment of pensions schemes must be somewhat changed.

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- Another effect of the present tax treatment of pensions is its implicit indexation of the tax base for inflation. This effect, too, is a consequence of the fact that pensions move the tax system towards an expenditure base.

- Finally, one of the more important consequences of pensions, judging by the treatment it receives in the literature, is their effect on individual behaviour. Much controversy centres not on the tax treatment of pensions per se but on the design and financing of public pension schemes.

This paper considers all these issues, with reference to the limited literature.

THE PIT'S TREATMENT OF PENSIONS

Before we consider issues for tax policy, it is useful to survey the way the PIT treats pensions. Canada has four types of pension instruments that receive special treatment under the tax system - Registered Pension Plans (RPPs), Registered Retirement Savings Plans (RRSPs), the Canada (or Quebec) Pension Plan (CPP/QPP), and the Old Age Security system with its Guaranteed Income Supplement (OAS/GIS). Some provinces also provide supplementary benefits out of their own revenue sources; an example is Ontario's Guaranteed Annual Income System (GAINS), an income-adjusted transfer system for persons 65 years of age and over.

Retired people may, of course, have other sources of income. One is private saving, a subject we deal with in another paper in this volume. Whole life insurance policies provide retirement saving as well as certain tax advantages. The aged in need can take advantage of the various welfare programs financed jointly by the federal and provincial governments under the Canada Assistance Program (CAP). Finally, the government provides the aged with certain types of in-kind transfers that can be viewed as implicit substitutes for retirement income; Medicare is a prime example.[1] This paper, however, deals with the tax treatment of pension vehicles and touches only in passing on other sources of retirement income.

Private pensions

The private vehicles for pensions in Canada are RPPs and RRSPs. The

tax treatment of RPPs is straightforward. An individual's contributions to such plans are tax deductible up to $3,500 per year, as are the employer's contributions on the employee's behalf. This limit is not indexed. Capital income accumulated in the pension fund is tax exempt. When pension benefits are received by the contributor or the spouse, they are taxed as ordinary income for that year. The first $1,000 of pension income (excluding OAS/GIS and CPP benefits) is, however, tax exempt each year. This limit is not indexed. In addition, the tax system provides all persons 65 years of age and over with an age exemption - $1,980 in 1981. This sum is indexed to the Consumer Price Index (CPI).

The rules for RRSPs are somewhat more complex. The taxpayer's contributions on his or her or the spouse's behalf are tax deductible up to a limit of the lesser of $5,500 or 20 per cent of earned income per year if no RPP contribution is made. Otherwise, the limit is the lesser of $3,500 or 20 per cent of earned income minus the RPP contributions. These limits are not indexed. As well, certain other receipts, such as retirement allowances, severance payments, and pension payments, can be rolled over tax free into an RRSP. The capital income earned on the fund is tax exempt with no limit. RRSP funds must be invested in bonds, mortgages, stocks, or life insurance policies; 90 per cent of the funds must be invested in Canada. Until November 1981, money borrowed to finance RRSP contributions was tax deductible.

Taxpayers can draw down RRSP funds whenever they wish (spouses cannot treat withdrawals as their own income until two years after the last contribution), although such funds are fully taxed on removal. This feature makes RRSPs suitable as an income-averaging device. By the time an RRSP-holder reaches age 71, all its funds must have been used to purchase either an insured annuity or a registered retirement income fund that provides income until age 91 plus a capital balance. RRSP benefits are eligible for inclusion in the $1,000 pension income deduction.

Public pensions

The public component of pensions in Canada consists of OAS/GIS and CPP (or QPP). OAS is a lump-sum payment ($2,295.36 per year in 1980) to all persons 65 years old and over. The GIS is an income-tested payment to the same cohorts (a maximum of $2,304.36 per year in 1980). The benefit amounts are indexed to the CPI. For every $2.00 of personal income that

a GIS recipient receives, benefits are reduced by $1.00 until they disappear. Included in the personal income subject to the 50-per-cent tax-back are other pension receipts, including provincial supplements such as GAINS. Since most of them are income-tested, the tax-back rate increases significantly when they are included. Both OAS and GIS are taxable income to the recipients, although GIS recipients are effectively not taxed due to the PIT's other tax exemptions. Both OAS and GIS are financed out of general revenue and are thus like pay-as-you-earn (PAYE) pension systems.

The CPP is a contributory pension scheme financed from a fund accumulated through a tax on earnings. The member and the employer each pay in 1.8 per cent of the member's earnings to a maximum ($13,100 in 1980); there is an exemption at the low end of the annual wage scale. The annual CPP retirement benefit is 25 per cent of career-average earnings, subject to a maximum ($2,933.28 in 1980); the plan also pays survivor benefits, disability pensions, death benefits, and dependent children's benefits. The ceiling for pensionable earnings rises with the average industrial wage, while benefits are indexed to the CPI. Contributions to the CPP are tax deductible, and benefits are taxable income when received.

Despite the fund associated with the CPP, the plan is not fully funded in the actuarial sense; that is, the value of the contributions falls short of the expected benefits in present-value terms. Thus, the scheme differs from a private pension scheme since the fund is bound to run out some time.[2]

Owner-occupied housing

A significant amount of saving for life-cycle smoothing takes the form of acquiring equity in owner-occupied housing. In a sense, it is a substitute for retirement savings of other forms. Special tax treatment is involved. Basically, no tax is imposed on the return from investing in a principal residence, neither on the imputed rent during occupancy nor on any capital gain that accrues over time or is realized upon sale. The costs of acquiring equity, such as mortgage interest, depreciation, maintenance, and the imputed costs of equity finance, are not tax deductible. (Investment in rental housing is, however, subject to taxation on the rental proceeds and receives deductions for costs.)

The tax-free status of income from owner-occupied housing arises from the administrative costs that would be involved in having taxpayers include imputed rents in income. It does, however, give rise to some anomalies. First, although mortgage interest is not deductible to the homeowner, it is typically taxed in the hands of the creditor. Since the tax is on the nominal interest returns, it actually falls on part of the real value of the principal. It seems quite likely that capital markets enable creditors to recoup part of this tax on principal by driving nominal interest rates up by more than the rate of inflation. If so, inflation causes the real mortgage rate to borrowers to rise, making mortgage-financing of home ownership more expensive.

Another anomaly arises when a retired person wishes to run down the equity in his or her home by 'reversing the mortgage' (allowing the homeowner's equity to decline rather than increase over time) or by some equivalent device that yields a flow of interest-like income. This income becomes taxable on receipt even though interest was not deductible when the house was acquired with mortgage financing. Thus, the life-cycle treatment of housing is not completely tax free.

THE TAX TREATMENT OF PENSIONS AS EXPENDITURE-TAX DEVICES

As far as tax policy is concerned, the most important aspect of pensions is probably the fact that their present tax treatment implicitly renders them devices for moving an income-based tax system towards an expenditure-based system. The pros and cons of expenditure taxation have been discussed fully in the literature,[3] so a brief summary will suffice here.

Arguments for expenditure-based taxation

Efficiency

Efficiency grounds offer no a priori reason to prefer expenditure taxation over income taxation. So long as taxes are proportional, an expenditure tax leaves undistorted the margin between present and future consumption (i.e., the savings decision), whereas an income tax imposes a relatively larger tax on future consumption. However, both taxes distort the choice between consumption and non-market activities such as leisure. Thus, using the theory of second best, we cannot say whether proportional ex-

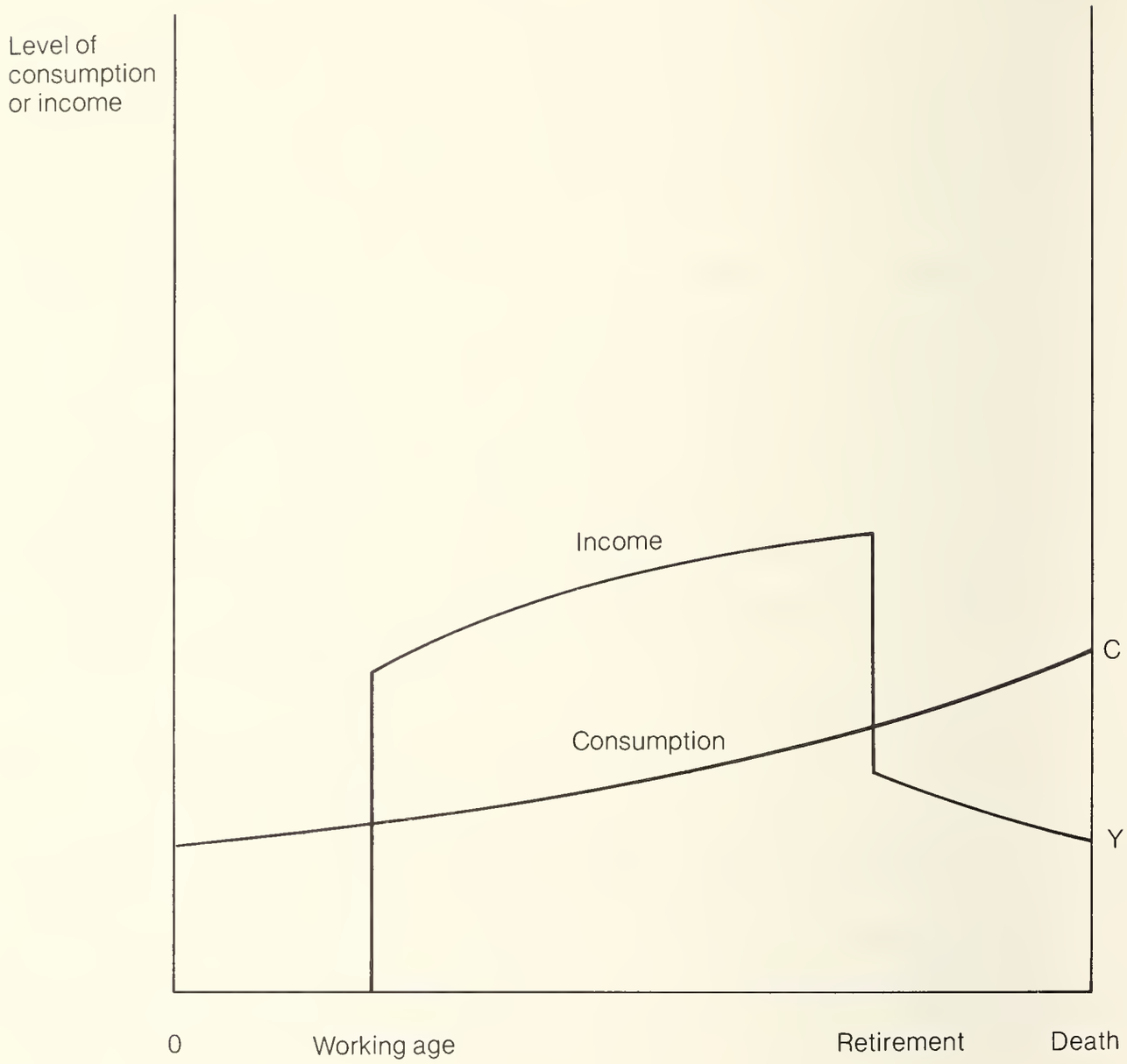
penditure taxation is preferable to proportional income taxation.[4] It all depends on the elasticity of substitution among present consumption, future consumption, and the non-taxed good.

The preceding argument applies whenever marginal tax rates are constant - not only in proportional taxation but also in linear progressive taxation, in which a fixed exemption level supplements the marginal tax rate, making average tax rates progressive.[5] Once marginal tax rates are graduated (as in the existing PIT), however, both expenditure and income taxation distort the relative prices of present and future consumption. Which one distorts the savings decision more depends upon the lifetime profiles of the income and expenditure streams.

To see why this relationship exists, let us consider the two streams. The typical income stream rises during the individual's working life and falls sharply in retirement when only capital income accrues and consumption is financed partly out of formerly acquired wealth. The expenditure stream is likely to be smoother, assuming that one accounts for expenditures on the basis of the flow of imputed services rather than on the basis of cash flow - that is, if one treats purchases of consumer durables as expenditures only as they yield service rather than when paid for. (Typical theoretical patterns of life-cycle income and expenditure are shown in Figure 1.) The life-cycle theory of consumption suggests that if people have diminishing marginal utility of consumption, their consumption streams will rise over time so long as the interest rate facing them exceeds their pure rate-of-time preference.

If marginal tax rates are progressive and if lifetime averaging devices do not exist, an expenditure tax on imputed consumption services raises the relative price of future consumption above the no-tax level since marginal tax rates will be higher in the future. The result is a substitution effect away from future consumption. Under an income tax, the effect of progressivity is not as important as under a consumption tax because the time stream of labour income is largely exogenous. Nonetheless, because a progressive income-based tax still falls on capital income, it offers a disincentive to save for future consumption. Presumably, the relative price distortion against saving due to income taxation is larger than that due to expenditure taxation unless the marginal tax rates under the latter are extremely progressive. The effect of progressivity is especially important if the expenditure tax is based on cash flow rather than on imputed consumption.

Figure 1
A typical pattern of life-cycle income and expenditure



To summarize, the efficiency case for expenditure taxation is not clear cut. Although an expenditure imposes a smaller disincentive to save, it, like the income tax, distorts other margins, such as the leisure-consumption one. We must remember, however, that it may be sensible to treat the savings decision more favourably than other decisions. Saving may simply be more sensitive to relative prices than is, say, working. Or the savings decision may already be subject to distortions elsewhere in the economy. For example, other types of taxes on capital (e.g., the corporate tax or property taxes) may distort the savings-investment decision. In an open economy, however, influencing the savings decision usually cannot remove distortions of the investment decision. The two decisions

are quite separate when capital is free to flow into and out of the economy.[6]

The savings decision itself may have other distortions. One cited frequently in the literature on the social discount rate is the possibility of externalities associated with the act of individual saving. Some authors suggest that saving for future generations is a public good to the extent that all members of the present generation benefit from it.[7] Decentralized saving, runs the argument, leads to too little savings for future generations because each person neglects the beneficial effects his or her savings would have on contemporaries through their altruism towards future generations. In the same vein, an analyst who derives a concept of intergenerational equity from some notion of an intergenerational social welfare function may logically suggest that future generations should have more set aside for them than results from private capital markets.

These arguments may support a tax, such as the expenditure tax, that does not distort the savings decision. They do not, however, constitute a case for special treatment of pension savings, since what they encourage is larger bequests, rather than larger retirement savings.

Equity

Informal arguments for expenditure taxation are often based on considerations of equity, rather than efficiency. The gist of this approach is that if one wishes a tax that is ultimately related to utility levels, consumption seems a better proxy than income since utility is presumably derived from the former rather than the latter. As Kaldor (1955) puts it, one should be taxed on what one takes out of the social pot rather than what one puts in.

It is easy to overestimate the force of this argument. In a world with no net bequests, the present values of the consumption and the non-capital income streams are identical, and which one taxes should not matter much on equity grounds. The important differences arise when one includes consideration of net bequests. Unless the bequests are treated as income in the hands of recipients, income taxation will miss a source of real income that expenditure taxation captures. However, a properly designed income tax system can capture net bequests. Thus, the real distinction between expenditure-based and income-based tax systems uses efficiency, rather than equity, grounds.

Deferral-of-income taxation

It is worth noting that the concept of using pensions to turn the present income-based tax system into an expenditure-based system really only applies to lifetime expenditure and not to bequests. Except in minor details, the tax treatment of pensions leads to expenditure taxation of retirement consumption but not of bequests. Indeed, it does the former only imperfectly. The effect of the PIT is to exempt from tax income contributed to a pension scheme, private or public, plus accumulated capital income on the fund itself and to tax income when received in retirement, whether it is used for consumption then or not. Thus, it is not a true expenditure tax but a deferral-of-income tax.

The exemption of capital income

Differences between pension treatment and expenditure taxation

Two aspects of the present tax treatment of pensions are especially relevant for tax policy. The first is the exemption of capital income when the fund is accumulating. Several aspects of the present PIT's treatment of pensions prevent its being analogous to expenditure taxation. First, as we have just noted, pension income is taxed on receipt whether it is used for consumption or not. If it is used for further saving - for bequests or for future consumption - the PIT imposes a relative price distortion. Thus, while the system removes the distortion on saving for retirement during one's working life, it does not remove the distortion on saving during retirement. To the extent that saving is done for bequest purposes[8] (or for self-insurance against outliving saving done during one's working life), this effect blunts the usefulness of the preferential treatment of pensions as a device for eliminating the distortion on savings.

Next, the existing treatment of pensions is restricted in its effect by the upper limits on the deductibility of contributions to RRSPs and the voluntary component of RPPs. A significant number of taxpayers are able to save beyond these limits and choose to do so. This intertemporal choice is subject to the full distortionary effect of income taxation. The tax savings on RRSP and RPP contributions (apart from their income-averaging aspects, which are discussed later) are lump-sum transfers. They have only wealth effects and do not remove the income tax's substitution effects

on savings. Moreover, the upper limits imposed upon RRSP and RPP contributions are effectively becoming tighter over time because they do not change although nominal incomes are rising both because of inflation and because of rising real per capita income. Several authors have noted this problem and have argued that, at minimum, the limits should be indexed (e.g., Bossons 1982; Daly 1982).

At lower income levels, the relative price effects of the tax treatment of RRSPs may be limited by the tax-back provisions of the OAS/GIS system. Federal payments under GIS tax back other income, including RRSP benefits, at 50 per cent, and this rate is increased significantly by provincial supplements. For potential recipients of the GIS, the tax-back considerably blunts the incentive to save, especially through RRSPs (Brown 1982).

Similarities between pension treatment and expenditure taxation

Despite voluntary pension schemes' limited coverage and despite the fact that they only approximate expenditure tax systems, they do have another beneficial aspect: like expenditure tax systems, they automatically index for inflation. (One of the advantages of expenditure taxation over comprehensive-income taxation is that the former does not require indexation because it makes capital income tax exempt or some equivalent.) One author suggests viewing the favourable treatment of RRSP income as a partial redress for the fact that many non-sheltered assets earn negative real rates of return (Brown 1982, 120).

One provision of the PIT treatment of pensions moves the system too far in the direction of expenditure taxation. The $1,000 pension-income deduction amounts to a double deduction for capital income since the pension income subject to the deduction has already been allowed to accumulate tax free. It is difficult to find a rationale for the $1,000 deduction. It is not needed as an offset for inflation or as a deduction of capital income. As a redistributive device, it is rather ineffective since it is worth more to taxpayers in higher income brackets than in low.

Asset allocation

Provisions of the PIT also affect the allocation of pension and other assets, with some interesting effects. We have already noted that RRSPs are

limited to certain types of assets (bonds, stocks, mortgages, and life insurance) and that 90 per cent of them must be Canadian. The tax system also influences portfolio choice. It treats pension receipts as ordinary income when taken out of the plan despite the fact that some originate in equity income that elsewhere would receive favourable treatment from the tax system. Pension funds obtain neither the dividend tax credit nor the preferential treatment of capital gains; in effect, they are not integrated with the corporate income tax system (CIT). Thus, in theory at least, ownership in pension funds brings a lower return to equity than that obtained by owning equity directly. This fact may partly account for the observed tendency of pension moneys to be used to purchase a high proportion of fixed-interest assets relative to equities (Brown 1982).

Owner-occupied housing is another asset form used to a significant extent to provide for retirement. Its treatment under the present PIT is substantially different from that given other non-pension assets. Holding one's own housing yields a return, in the form of imputed rent and capital gains, that is tax exempt. Thus, while the home is owned, capital income from it is tax free and the indexation of capital gains for inflation is no problem. In other words, the treatment, like the treatment of pensions, is an element of expenditure taxation in the tax system (Boskin and Shoven 1980).

Overall, this treatment provides an incentive to use equity-owned housing, rather than other non-pension assets to accumulate wealth.[9] On the other hand, if a homeowner runs down his or her equity during retirement, the capital income gained becomes taxable. Thus, as a vehicle for retirement saving, owning housing is effective from a tax standpoint only if the housing services are fully consumed. On the other hand, housing, unlike pensions, can be passed on to heirs. Thus, tax provisions may go a long way towards explaining why housing assets figure so prominently in bequests. The tax system, being a mixture of income- and expenditure-based taxes, effectively locks the aged into holding housing assets and prevents them from entering into 'reverse mortgages' to run down this form of wealth late in the life cycle.[10] Yet the system also offers strong tax advantages for using housing for bequest savings.

Equity considerations

The exemption from the tax base of capital income from RPPs and RRSPs has equity aspects. The benefits of these programs accrue more to persons in higher-income brackets than in low both because the proportion of the population that takes advantage of them rises with income level[11] and because the marginal tax rate is higher for the higher-income brackets, so that the value of a capital-income exemption is higher. (Recall that we are not here considering the averaging effects of these plans, which, as we shall see, can be justified on horizontal equity grounds.) These inequities are partly offset by the upper limit on contributions and by the fact that higher-income groups are presumably more heavily hit by what is otherwise a lack of indexing capital income for inflation.[12]

If one were starting out afresh, one could design an expenditure-based tax system whose progressivity reflected any desired amount of vertical equity, although that degree of progressivity would not necessarily be the same as that implicit in the ideal tax system based on comprehensive income. However, if one starts with the comprehensive-based tax and introduces capital-income exemptions while leaving the rate structure unchanged, these exemptions may be a move away from the vertical equity desired.

Rationalizing the tax base

One final point should be made about the tax structure and the distinction between consumption and income taxation. If policymakers opt for a comprehensive-income base for the PIT, all capital income should be fully taxable and indistinguishable from other income ('A buck is a buck', as the Carter Commission [Canada 1966] puts it). Furthermore, positive and negative capital income should be treated symmetrically. All capital losses, whether from interest payments on debt or capital losses on equity, should be allowed a full loss offset (preferably on an indexed basis). Preserving this symmetry is complicated, however, when the tax system contains components of an expenditure-based tax. Capital costs incurred in the acquisition of assets whose income is not taxed (e.g., housing and other durables, RRSPs) should not be deductible. Thus, the November 1981 federal budget made a sensible move in disallowing interest deductibility on debt used to acquire RRSPs and other sheltered assets. However, the

elimination of interest deductibility on debt used either to acquire assets whose capital income would be taxed or to finance current-consumption expenditures is unjustified. This provision is at variance not only with existing tax treatment but also with other changes contained in the 1981 federal budget.

Private pensions as income-averaging devices

Economists universally regard tax-base averaging as desirable on grounds of horizontal equity. Two taxpayers whose tax bases have the same present value ought to pay taxes of the same present value. Averaging differs slightly under income and expenditure taxation; the appropriate discount rate is the after-tax interest rate under income taxation, but the before-tax rate under expenditure taxation. In other words, the appropriate discount rate is the interest rate at which households can transform present into future consumption on the market.

Present provisions for averaging

Apart from its treatment of pensions, the present tax system has only a limited scope for averaging. Before November 1981, it had provisions for two types: general averaging, which was done automatically by the tax authorities, and income averaging annuity contracts (IAACs), which were available on certain types of income (e.g., royalties). General averaging applied when an individual's taxable income for one year rose a certain amount above the previous years'. It did not apply, however, when income fell, so that device was virtually ineffective for averaging between working and retirement years. IAACs could average large inflows over the future, but their scope was limited to certain types of receipts.

The 1981 budget abolished these forms of averaging and replaced them with a system of self-administered forward averaging. If personal income rises above a threshold amount in a given year and the taxpayer expects it to fall in the future, he can elect to average it forward by paying the maximum marginal tax rate (50 per cent) in the year in which the option is exercised; this payment is then refunded in any year or years that the taxpayer chooses to bring the averaged income back into the base. This system of averaging, like the former scheme, applies only when an individual's income rises in a particular year and is expected to

fall in the future. It is not effective for lifetime averaging.

Income averaging with pensions

One of the key roles performed by pensions, private and public, is to allow a taxpayer to average taxable income over his or her life cycle. They do so in a manner that corresponds to expenditure-tax averaging, rather than income-tax averaging, since capital income remains tax exempt while it is in a pension fund.

The RRSP is particularly useful as an averaging device since it is self-administered and individuals can tailor its use to their own needs. In principle, it is equivalent to establishing an expenditure tax base with averaging since the taxpayer can use it to average taxable income and accumulate capital income tax-free in the meantime.[13] Thus, if policymakers prefer an averaged expenditure tax or an income tax with capital income exempt, it is an ideal device. Of course, if policymakers wish an averaged comprehensive-income tax, the RRSP is not ideal since it effectively exempts capital income from taxation.

The use of pensions for lifetime averaging does have strict limits. For one thing, contributions have an upper limit that, as we have noted, is becoming more restrictive as time goes by. For another, the effectiveness of RRSPs as averaging devices is lost once the taxpayer reaches age 71. By then, the accumulated fund must be converted into an income-earning asset whose returns are taxable.

Some authors have suggested that the averaging qualities of RRSPs could be improved and yet the exemption of capital income be eliminated if contribution limits to RRSPs were relaxed but capital income were no longer allowed to accumulate tax free (see Daly 1982). It is not obvious that this change would make any difference. If accumulated capital income were taxable but contributions were relaxed, the taxpayer could always arrange to contribute to the RRSP an amount equal to the accumulated capital income, effectively offsetting the tax on it. Neither is it clear that any variant of the RRSP could be an averaging device for a comprehensive-income base. Accomplishing that would require some other device, such as averaging by the tax authorities themselves.

PUBLIC PENSIONS' INCENTIVE EFFECTS ON SAVING AND OTHER BEHAVIOUR

Although the large literature on the effect of public pensions on individual behaviour does not deal primarily with the tax treatment of pensions, some of its findings are worth surveying here. We begin with the relevant theory and go on to a discussion of the empirical evidence.

Theoretical aspects of public pensions

At the outset, it is useful to distinguish among various types of pension schemes and their properties. All public pension schemes are compulsory rather than voluntary, a fact that distinguishes them from private pension schemes. Within the category of public pensions are two polar forms - 'pay as you earn' (PAYE) and funded. In PAYE schemes, current benefits are financed completely out of current tax revenues. Thus, these plans channel continual transfers from the current working generation to the current retired generation (i.e., the previous working generation). Depending upon the incidence of the taxes used to finance them and the nature of the benefits, they may also entail some intragenerational transfers.

Over the long run, a given generation's implicit rate of return on its contribution to a PAYE pension scheme cannot exceed the rate of growth of GNP (e.g., population growth plus technical progress in some simple growth models). For the average person, this limit may or may not exceed the growth rate on private investment. The consensus seems to be, however, that society's before-tax rate of return from private investment does exceed the rate of growth of GNP.[14] Therefore, PAYE pension schemes are poor investments in terms of social efficiency; in that sense, a funded plan plus lump-sum intergenerational redistribution will make all generations better off then a PAYE scheme will.

Notice, however, that PAYE schemes perform two functions. First, they channel transfers between adjoining generations and thus make the intergenerational distribution of incomes more equal (assuming that incomes are growing over time). In judging these schemes' efficiency, this equity gain may outweigh the efficiency loss, since lump-sum redistribution among generations may not be feasible.[15] Second, PAYE schemes guarantee the retired generation a source of secure - and probably indexed - income that

might otherwise not be available. In other words, they provide a source of insured retirement income.

Insured retirement income can also be provided by the other form of public pension, the fully funded pension. A pension scheme is fully funded if each generation's contributions are put into a fund that can then be drawn upon to finance all retirement benefits. (Some pension schemes are funded but only partly so. Such a scheme must eventually become a PAYE scheme as the fund runs out.)

If a funded scheme's fund is put to productive use, it can yield the gross rate of return to society, so such a pension avoids the inefficiency of PAYE schemes.

No intergenerational transfer is implicit in a fully funded scheme; however, there may well be intragenerational transfers. Here it is useful to distinguish between two sorts of funded schemes. The first is fully funded for each individual in the sense that the expected present value of benefits just equals the present value of contributions, although ex post benefits and costs may differ owing to uncertainty about length of life (which is what any pension is intended to insure against). The other sort of funded scheme is one in which the contributions of a whole generation equal the expected present value of benefits for that generation. Such a scheme is actuarially fair for the entire generation but not necessarily for each person in it.

Assuming that a public pension scheme is going to exist and assuming that the gross return on capital does exceed the rate of growth of GNP,[16] the choice between a PAYE scheme and a funded one turns on the trade-off between the intergenerational equity benefits of the PAYE scheme and the efficiency benefits of the funded scheme. Of the two kinds of funded schemes, one that is actuarially fair on average for a generation will presumably be easier to administer than one that is actuarially fair for each individual.

Justifications for public pensions

The discussion suggests one reason for not leaving provision for retirement entirely to the private sector: if society desires an intergenerational transfer, it cannot be accomplished adequately through private markets. This statement can be disputed. The view that intergenerational transfers are made purely for reasons for efficiency (i.e., because of the altruism of

members of the current generation) implies that those transfers will be made voluntarily, through bequests and the like. That view may not suffice for two reasons. First, the benefits of intergenerational transfers may have a public-good aspect;[17] if they do, the free-rider problem may preclude the reliance on voluntary transfers. Second, if the reason for the transfers is intergenerational equity rather than efficiency, private transfers will not be effective. These points are arguments for a PAYE system, and once such a system is in place, it may well be in the continuing interest of the voting population to perpetuate its existence even though the intergenerational contract is only an implicit one.[18]

The remaining arguments for public pensions do not involve intergenerational transfers and so pertain more to funded schemes. One is that individuals and households are uncertain about the length of their working lives (Diamond and Mirrlees 1979), about the length of their consuming lives, and about inflation, so they desire insurance against not being able to provide for consumption needs in retirement. This insurance is provided through public pensions because private insurance markets do not seem to be able to provide an indexed annuity capable of insuring against a household's working life being too short for its consumption life. (A plausible reason for this failure is the phenomenon of 'adverse selection'. Households that expect a longer-than-average consumption life are anxious to purchase such annuities and drive up the price, so households that anticipate an average lifespan do not wish to purchase them.)

The final argument for public pensions is simply one of paternalism. Some analysts argue that many individuals exhibit extremely myopic saving behaviour and simply do not provide sensible sums for themselves in retirement (Diamond 1977; Diamond and Hausman 1980). In this view, public pensions are partly forced-savings schemes that, no matter how illiberal they may seem, are highly valued ex post.

An incidental effect of public pensions is that they usually involve a significant amount of intragenerational redistribution of lifetime income. One can argue on positive grounds that they get legislated partly for that reason. (A growing body of literature uses the median-voter paradigm to explain why governments get involved in redistribution through the compulsory provision of otherwise private goods and services.[19] These programs are often extremely inefficient ways of redistributing income.)

The existing scheme of public pensions in Canada is a mixture of PAYE and partial funding. The OAS/GIS, combined with the PIT's old-age

and pension exemptions, is effectively a PAYE system. Its indexing provisions mean that it grows roughly at the rate of inflation, rather than the rate of growth of nominal GNP; thus, its real rate of return over generations is effectively zero, so its intergenerational-transfer component is minimal and declining relative to GNP over time. The CPP is funded in the sense that contributions are placed into a fund out of which benefits are paid. However, the funding is partial; it is not sufficient to pay for all existing liabilities, so in the absence of changes in contribution rates, it will eventually run out. The accumulated contributions are not put on capital markets. Instead, they are made available to the provinces (in proportion to the contributions of the residents of each) at favourable interest rates. Depending upon how the provinces choose to use them, the funds may or may not yield the full gross rate of return to society that they would if used to finance investment.

Public pensions and capital accumulation

The theoretical analysis of the efficiency effects of public pension schemes implicitly assumes that the economy is a competitive and growing one consisting of a sequence of overlapping generations, each of which behaves according to the tenets of the life-cycle hypothesis of saving.[20] In such a model, the main inefficiencies arise because of the impact of pensions on capital accumulation. Funded pensions are seen as a perfect substitute for private savings so their introduction does not change the economy's growth path. Typically, funds invested are assumed to earn a return to society that is greater than the rate of growth of GNP (i.e., the biological rate of interest). This implies that society has too little capital, and funded pensions do nothing to improve the situation.[21] Some authors point out that a pension scheme that is effectively more than 100 per cent funded is, therefore, socially efficient; equivalently, so is any tax whose proceeds are used to fund public saving.[22] All these analyses ignore the existence of taxes on capital in the form of either corporate or personal income taxes, which may themselves give rise to inefficiently low levels of capital. They also overlook the point that funded pensions may be undesirable on equity grounds.

Another important issue is whether pension funds can have <u>any</u> effect on capital accumulation in an open economy that has perfect capital flows. As Fried and Howitt (1980) point out, if capital is available at a fixed rate

of return on world markets, pension funds can influence the amount of aggregate savings available but not aggregate investment. To increase investment, capital taxes have to be changed directly.

Even funded pensions can introduce other forms of inefficiency. Labour markets are an example. If pensions are not funded on an individual basis and if retirement is a condition of the receipt of benefits, there is a strong relative price effect in favour of early retirement. This induced retirement effect has been a source of some concern in the United States, but it is somewhat less of a problem in Canada. The OAS/GIS system is not contingent upon retirement, while the CPP permits additional benefits to accrue to a person who chooses continued work rather than retirement.

The impact of PAYE pensions, not funded pensions, on aggregate savings and capital accumulation is, however, the centre of most of the controversy in the literature. Most theoretical analyses of the inefficiency of public PAYE pensions assume that contributions to them are more or less perfect substitutes for private savings. But since the proceeds are used to finance the consumption of the currently retired, no capital is created. Thus, the gross rate of return of capital formation is forgone; instead, the funds yield to each generation an implicit return equal to the rate of growth of GNP. (The generation that is retired at the time the plan is introduced obtains a windfall gain, while the generation that is retired when it is terminated suffers a loss.) Society is left without the capital that would otherwise be accumulated.

It is easy to stipulate the circumstances under which this model would fit the case.[23] If all individuals behaved according to the tenets of the life-cycle hypothesis, leaving no net bequests, if capital markets were perfect, and if the retirement age were fixed, the PAYE pension contributions would approximately replace private saving for capital accumulation. Notice, however, that even under these stringent assumed circumstances, the replacement would be only approximate for two reasons. First, replacing private savings with a PAYE pension has a lifetime wealth effect owing to the fact that such a plan usually yields a rate of return different from the after-tax rate the individual could obtain from savings in capital markets. This difference can go either way. A second reason, one related to the first, is the fact that public pension schemes yield returns that are taxed on an expenditure basis while private savings may be double taxed at the margin. It is impossible to predict which way

these effects will work - that is, whether the reduction in private savings will be greater than or less than the PAYE contributions.

These ideal circumstances (not so ideal from a social point of view) are unlikely to hold in practice. For example, the retirement age may not be fixed. Then, if the plan does tend to induce early retirement, the working life will be shortened relative to retirement life and more saving will have to be done to provide for the latter. Thus, PAYE contributions will only partly reduce private savings. (This situation is less likely in Canada than in the US because of the previously mentioned differences in the structures of the two countries' public pensions.)

More important, the behavioural assumptions of the life-cycle model may simply not hold. People may not plan rationally for the future so a paternalistically motivated scheme for compulsory saving may not displace other saving. Some authors actually argue that public pension plans lead to extra savings by inducing a 'recognition effect' that makes people more aware of the need to save for retirement (e.g., Cagan 1965) or by making retirement-income objectives appear more feasible (Katona 1965).

Even within the context of the life-cycle hypothesis, once one introduces a bequest motive, the concept of PAYE-pension contributions as a substitute for private savings becomes suspect. Taking the argument to an extreme, private behaviour aimed at making bequests may completely undo the effects of PAYE pensions. Suppose people leave bequests because of altruism towards future generations. If the government attempts to impose a PAYE system that transfers income from the younger generation to the older one, it puts individual decisions about bequests out of equilibrium. The current generation, seeing that the PAYE pension system makes future generations worse off relative to its own, will compensate by increasing bequests, thereby undoing the effects of pensions on savings (Barro 1974). In this case, the PAYE public pension scheme would be of no consequence; it would simply be accompanied by larger bequests.

In other words, in theory anything can happen. Depending upon the behaviour of individuals, savings may be very or not very responsive to PAYE pensions. The question is essentially empirical.

Empirical effects of pensions

US studies

Let us, therefore, turn to the literature on empirical results. The original empirical study on the effects of pensions on private savings was that of Feldstein (1974) for the United States, and it has provided the basic methodology for subsequent work. Using annual aggregate data, he estimated an Ando-Modigliani consumption function (see Ando and Modigliani 1963) that included an explanatory variable called Social Security wealth. This variable consisted of the present value of all future US Social Security payments expected by the currently working generation. The coefficient on this variable was intended to capture the impact of the Social Security system on current consumption and thus on saving. Feldstein argued that on theoretical grounds one could not predict what the sign of the coefficient would be since it would incorporate both a savings substitution effect and an induced-retirement effect. The coefficient he obtained was significantly positive, indicating that the Social Security system results in a net reduction in private savings. His back-of-the-envelope calculations indicated that the savings substitution could be substantial; he conjectured that it might have reduced 1971 private savings by as much as half of what it would otherwise have been. Leimer and Lesnoy (1982) later discovered, however, that Feldstein had made a computational error in calculating his Social Security wealth variable, rendering his results unreliable. Subsequently, Feldstein (1982) reran his equations, using a corrected series for the variable and updated data on national income, and confirmed his earlier result that Social Security had a large negative impact upon private savings.

Feldstein's early work generated a spate of empirical research, most of which involved variants of his work. Munnell (1974) attempted to separate the induced-retirement effect by adding a variable for the retirement rate of men age 65 or over. She found that the coefficient on Social Security wealth, now purged of the induced retirement effect, increased by about one-fifth.

Of the many other studies, some have supported the original Feldstein contention, and some have yielded insignificant coefficients on Social Security wealth. Feldstein (1978) and Boskin and Robinson (1980), for example, found significant coefficients. Feldstein (1980) also found a signi-

ficant coefficient using international cross-section data. On the other hand, Barro (1978) found that the coefficient became insignificant when a government-surplus variable was added, and Barro and MacDonald (1979) obtained the same result for a mixture of cross-section and time-series data from international sources. Conflicting evidence has also been obtained using micro data, which allows the analyst to estimate Social Security's effect on private wealth: Kotlikoff's (1979) results were inconclusive, while Feldstein and Pellechio (1979) found Social Security to be a close substitute for private saving.

Other work has tested more directly the life-cycle model underlying Feldstein's empirical analysis. Diamond and Hausman (1980), also using longitudinal micro data, found that the life-cycle theory cannot explain saving behaviour, especially of lower-income groups. Kotlikoff and Summers (1981) used aggregate time-series data from the US to argue that life-cycle smoothing accounts for a relatively small part of actual savings behaviour. Instead, a substantial amount of wealth accumulation is transferred intergenerationally by bequests. David and Menchik (1981) directly tested the responsiveness of bequest behaviour to Social Security, using data from Wisconsin income-tax records. Their study failed to find a significant change in bequest behaviour in response to changes in Social Security wealth. Their results lent no support to Barro's hypothesis but did not provide strong support for Feldstein's theory either.

In other words, the empirical results on the impact of the US Social Security system on savings in that country are inconclusive. In particular, it has not been established that Social Security and private savings are perfect substitutes. Neither has it been proved that individuals will nullify the effect of a PAYE pension system by adjusting their savings for bequests. These ambiguous results are not surprising, given the sorts of empirical models that have been used. For one thing, as Burbidge and Robb (1980) argue, it will take a fairly long time for the economy's behavioural relations to adjust to a change in the system of intergenerational transfers, so the consumption function is not likely to be as stable as time-series analysis requires. For another, the use of consumption-function estimates in isolation is likely to give misleading results for the exogenous impact of Social Security. Some items that enter the consumption function (income, retained earnings, private wealth) are endogenous variables whose magnitudes are likely to be affected by Social Security wealth. Simulations of the effect of Social Security wealth that are based

on estimates of the aggregate consumption function ignore these feedback effects. Yet they were found to be empirically important in a crude dynamic model of the economy, incorporating Feldstein's consumption function, that was estimated by Beach, Boadway, and Gibbons (1984).

Canadian studies

The impact of public pensions on saving in Canada has been the subject of some empirical work, much of it following the methodology of Feldstein. The aggregate-time-series analysis of Boyle and Murray (1979) found no evidence that the OAS and CPP had any impact upon private savings, a result confirmed by Wrage (1980) and Daly and Wrage (1981a). It is hard to know what to make of these results. Any negative effect of the OAS and CPP may simply have been offset by increases in RRSP, RPP, and RHOSP savings, which rose substantially over the postwar period. Daly and Wrage (1981b) also argued, using time-series evidence, that higher personal tax rates had caused higher RRSP and RPP contributions but that the PIT's old-age exemption had reduced them. This finding is what one would expect a priori.

Daly (1981) used cross-section data based on 1975 and 1976 income tax returns to estimate the responsiveness to the CPP of private retirement savings via RRSPs. His regression analysis attempted to explain RRSP contributions, using age, income, the marginal tax rate, and CPP contributions (but not wealth) as exogenous variables. He found that current CPP contributions had had a strong negative effect on RRSP contributions, indicating that the two are close substitutes. This result, unlike that of Boyle and Murray (1979), indicates that private saving has a fairly strong responsiveness to public pensions in Canada. But notice that Daly omitted consideration of the OAS, while Boyle and Murray included it. More empirical evidence would be desirable.

Studies of public pensions and induced retirement

Some investigators have also looked at the impact of public pensions on the retirement decision. This subject is of particular interest in the US, where staying in the work force upon reaching retirement age has a strong opportunity cost. Here again, the evidence is conflicting. As already mentioned, Munnell (1974) claimed to have found indirectly that Social

Security has an early-retirement effect. She deduced this effect by observing that the responsiveness of saving to Social Security increased 20 per cent when the retirement rate of men age 65 and over was added to the Feldstein consumption function. This change she attributed to induced retirement. In more direct tests of the retirement effect, Kotlikoff (1979), using census data, argued that Social Security does not significantly affect retirement, but Boskin (1977), Quinn (1977), and Burkhauser (1980) found that it does.

One would not expect the induced-retirement effect to be very strong in Canada since the public pension plans here do not have the same relative price effect as the US system does. This expectation is confirmed in the work of Daly and Wrage (1981a), who found, using time-series data, that neither the OAS nor CPP induced early retirement. They argued that the CPP caused a postponement of retirement, if anything. On the other hand, Burbidge and Robb (1980) found that expected pension benefits, both public and private, did lead to early retirement. Here, as on the effect of pensions on saving, the jury still appears to be out.

NOTES

1 In many ways Medicare is a fairly close substitute for a 'pay-as-you-earn' (PAYE) pension scheme and might be considered to have similar effects on savings. We do not, however, treat it explicitly here.

2 Pesando and Rea (1977) have estimated that the CPP fund will be depleted sometime between 1995 and 2000.

3 Kaldor (1955) presented the original case for the expenditure tax. A sampling of the recent literature includes the Carter Report (Canada 1966), Meade (1978), the Blueprints for Basic Tax Reform (United States 1977), Boskin (1977), Mieszkowski (1980).

4 This statement is the essence of the famous paper by Little (1951).

5 Under a linear progressive tax system, tax payments, T, are given by: $T = t(Y - E)$, where t is the fixed marginal tax rate, Y is income, and E is the exemption level. Although the marginal tax rate, t, is constant (provided negative taxes are allowed), the average tax rate, T/Y, rises with Y.

6 See 'The personal income tax: implications for investment', table 2, elsewhere in this volume.

7 Marglin (1963) and Sen (1961) suggested this theory independently.

8 See the evidence in Kotlikoff and Summers (1981)and David and Menchik (1981).

9 Smith (1982) points out, however, that it is easy to exaggerate the magnitude of the incentive to accumulate wealth in housing.

10 Fulton (1982) makes proposals that advocate greater use of 'reverse mortgages'.

11 Brown (1982, 108, table 1) presents evidence.

12 Other evidence of the regressive nature of pensions is in Beach, Card, and Flatters (1981) for the CPP and in Cloutier (1978) for OAS/GIS.

13 Davies (1982) proposes an alternative method of achieving the same goal; it involves wealth-transfer taxation.

14 See, for example, Feldstein (1977), Pesando and Rea (1977), Burbidge (1982), and Evans (1982).

15 The intergenerational redistribution of income may actually be efficient as well if the utility function of the current working generation includes altruism towards the currently retired. This hypothesis is an interpretation of the view of Weldon (1976).

16 This situation is what Burbidge (1982) calls the classical case, as opposed to the Samuelson case in which the growth rate exceeds the rate of return.

17 As suggested by Sen (1961), Marglin (1963), and Thurow (1971).

18 Using a model of majority voting in which the preferences of the median voter rule, Townley (1981) shows that this situation may be the case.

19 Usher (1977) has provided a sophisticated analytical treatment of the issue. Mueller (1979) offers a more intuitive discussion.

20 Samuelson (1958) originally devised the overlapping-generation model. For a summary of the life-cycle hypothesis of saving, see 'The personal income tax: implications for savings' elsewhere in this volume.

21 Burbidge (1982) also points out that such an economy might be dynamically unstable.

22 This point is discussed in the survey by Burbidge (1982).

23 The case described here is basically that used by Feldstein (1974).

REFERENCES

Ando, A., and F. Modigliani (1963) 'The "life cycle" hypothesis of saving: aggregate implications and tests.' American Economic Review 53, 55

Barro, R.J. (1974) 'Are government bonds net wealth?' Journal of Political Economy 82, 1095

- (1978) 'The impact of social security on private saving: evidence from the U.S. time series.' American Enterprise Institute for Public Policy Research, Study no. 199 (Washington, D.C.)

Barro, R.J., and G.M. MacDonald (1979) 'Social security and consumer spending in an international cross section.' Journal of Public Economics 11, 275-91

Beach, C.M., with D.E. Card and F. Flatters (1981) Distribution of Income and Wealth in Ontario: Theory and Evidence (Toronto: Ontario Economic Council)

Beach, C.M., R.W. Boadway, and J.O. Gibbons (1984) 'Social security and aggregate capital accumulation revisited: dynamic simultaneous estimates in a wealth-generation model.' Economic Inquiry 22, 68-79

Boskin, M.J. (1977) 'Social security and retirement decisions.' Economic Inquiry 15, 1

Boskin, M.J., and M. Robinson (1980) 'Social security and private saving: analytical issues, econometric evidence and policy implications.' In US Congress, Joint Economic Committee, Special Study on Economic Change 8, Social Security and Pensions: Program of Equity and Security, pp. 164-70

Boskin, M.J., and J.B. Shoven (1980) 'Issues in taxation of capital income in the United States.' American Economic Review, Papers and Proceedings 70, 164-70

Bossons, J. (1982) 'Inflation, capital taxation and reform of the personal and corporate income taxes.' In Thirsk and Whalley (q.v.)

Boyle, P.M., and J. Murray (1979) 'Social security wealth and private saving in Canada.' Canada Journal of Economics 12, 456-8

Brown, R.D. (1982) 'A critical view of tax shelters: Loophole or escape hatch?' In Thirsk and Whalley (q.v.)

Burbidge, J.B. (1982) 'Public pensions plans in Canada: alternative views.' In Thirsk and Whalley (q.v.)

Burbidge, J.B., and A.L. Robb (1980) 'Pensions and retirement behaviour.' Canadian Journal of Economics 13, 421

Burkhauser, R. (1980) 'The early acceptance of social security - an asset maximization approach.' Industrial and Labor Relations Review 33, 484

Cagan, P. (1965) The Effect of Pensions Plans on Aggregate Saving; Evidence from a Sample Survey (New York: National Bureau of Economic Research and Columbia University Press)

Canada (1966) Report of The Royal Commission on Taxation. 6 vol. (Ottawa: Queen's Printer)

Cloutier, J.E. (1978) 'The distribution of benefits and costs of social security in Canada, 1971-1975.' Economic Council of Canada Discussion Paper no. 108 (Ottawa)

Daly, M.J. (1981) 'The role of Registered Retirement Savings Plans in a life-cycle model.' Canadian Journal of Economics 14, 409-21

- (1982) 'An analysis of Registered Retirement Savings Plans and their role in Canada's retirement income system.' Ph.D. thesis, Queen's University

Daly, M.J., and P. Wrage (1981a) 'The impact of Canada's Old Age Security program on retirement saving, labour supply and retirement.' Economic Council of Canada Discussion Paper no. 203 (Ottawa)

- (1981b) 'The effect of income tax incentives on retirement savings: some Canadian evidence.' Eastern Economic Journal 7, 163-74

David, M., and P.L. Menchik (1981) 'The effect of social security on wealth accumulation and bequests.' Paper presented at Public Finance Workshop, Queen's University (September)

Davies, J.B. (1982) 'Does Canada need capital transfer taxation?' In Thirsk and Whalley (q.v.)

Diamond, P.A. (1977) 'A framework for social security analysis.' Journal of Public Economics 8, 275

Diamond, P.A., and J.A. Hausman (1980) 'Individual savings behaviour.' Economics Department, MIT. Unpublished

Diamond, P.A., and J.A. Mirrlees (1979) 'A model of social insurance with variable retirement.' Journal of Public Economics 10, 295

Evans, J.C. (1982) 'Comment.' Following Burbidge in Thirsk and Whalley (q.v.)

Feldstein, M.S. (1974) 'Social security, induced retirement and aggregate capital accumulation.' Journal of Political Economy 82, 905

- (1977) 'Does the United States save too little?' American Economic Review, Papers and Proceedings 67, 116

- (1978) 'Reply.' In Robert Barro, ed., The Impact of Social Security on Private Saving: Evidence from U.S. Times Series (Washington, D.C.: American Institute for Public Policy Research), pp. 37-47

- (1979) 'The effect of social security on saving.' US National Bureau of Economics Research, Working Paper no. 334 (Cambridge, Mass.)

- (1980) 'International differences in social security and saving.' Journal of Public Economics 14, 225-44

- (1982) 'Social security and private savings: reply.' Journal of Political Economy 90, 630-42

Feldstein, M.S., and A. Pellechio (1979) 'Social security and household wealth accumulation: new micro econometric evidence.' Review of Economics and Statistics 61, 361-8

Fried, J., and P. Howitt (1980) Pensions in a General Equilibrium Model of Canada Economic Council of Canada, Discussion Paper no.168 (Ottawa)

Fulton, P. (1982) 'Tax preferences for housing: is there a case for reform?' In Thirsk and Whalley (q.v.)

Kaldor, N. (1955) An Expenditure Tax (London: George Allen and Unwin)

Katona, G. (1965) Private Pensions and Individual Saving (Ann Arbor:

Survey Research Center, Institute for Social Research, University of Michigan)

Kotlikoff, L.J. (1979) 'Testing the theory of social security and life cycle accumulation.' American Economic Review 69, 396-410

Kotlikoff, J.J., and L.H. Summers (1981) 'The role of intergenerational transfers in aggregate capital accumulation.' Journal of Political Economy 89, 706-32

Leimer, D.R., and S.D. Lesnoy (1982) 'Social security and private saving: new time-series evidence,' Journal of Political Economy 90, 606-30

Little, I.M.D. (1951) 'Direct versus indirect taxes.' Economic Journal 61, 577-84

Marglin, S.A. (1963) 'The social rate of discount and the optimal rate of investment.' Quarterly Journal of Economics 77, 95-111

Meade, J. (1978) The Structure and Reform of Direct Taxation (London: Allen and Unwin)

Mieszkowski, P. (1980) 'The advisability and feasibility of an expenditure tax system.' In H. Aaron and M. Boskin, eds. The Economics of Taxation (Washington, D.C.: The Brookings Institution)

Mueller, D.C. (1979) Public Choice: Cambridge Surveys of Economic Literature (Cambridge: Cambridge University Press)

Munnell, A.H. (1974) The Effect of Social Security on Personal Savings (Cambridge, Mass.: Ballinger)

Pesando, J.E., and S.A. Rea, Jr. (1977) Public and Private Pensions in Canada: An Economic Analysis (Toronto: University of Toronto Press for the Ontario Economic Council)

Quinn, J.F. (1977) 'Microeconomic determinants of early retirement: a cross sectional view of white married men.' The Journal of Human Resources 12, 329

Samuelson, P.A. (1958) 'An exact consumption-loan model of interest with or without the social contrivance of money.' Journal of Political Economy 66, 467

Sen, A.K. (1961) 'On optimizing the rate of saving.' Economic Journal 71, 479-96

Smith, L.B. (1982) 'Comments.' In Thirsk and Whalley (q.v.)

Thirsk, W., and Whalley, J., eds. (1982) Tax Policy Options in the 1980s. Canadian Tax Foundation Tax Paper no. 66. (Toronto)

Thurow, L.C. (1971) 'The income distribution as a pure public good,' Quarterly Journal of Economics 85, 327-36

Townley, P.G.C. (1981) 'Public choice and the social insurance paradox: a note.' Canadian Journal of Economics 14, 712

United States (1977) Blueprints for Basic Tax Reform (Washington, D.C.: Department of the Treasury)

Usher, D. (1977) 'Public property and the effect of migration upon other residents of the migrants' countries of origin and destination.' Journal of Political Economy 85, 1001

Weldon, J.C. (1976) 'On the theory of intergenerational transfers.' Canadian Journal of Economics 9, 559

Wrage, P. (1980) The Effects of the Growth of Private and Public Pension Plans on Savings and Investment in Canada Economic Council of Canada, Discussion Paper no. 174 (Ottawa)

The Personal Income Tax: Implications for Investments

Robin Boadway* and Neil Bruce**

INTRODUCTION

The purpose of this paper is to investigate the way in which the personal income tax (PIT) influences the firm's decision to undertake real investment expenditures. Of course, the bulk of investment is undertaken by firms that pay no personal taxes; therefore, the effect of the PIT, if any, is indirect, coming primarily from its impact on the cost of finance to the firm.[1] This and other indirect effects are, however, worth investigating in themselves and in regard to the suggestion that Ontario might adopt its own PIT system. In the same regard, we also look at investment by unincorporated businesses, which the PIT does affect directly, and at the integration of the PIT and the corporate income tax (CIT).

Before examining influences on investment decisions, one must have some view about how those decisions are taken. The next section presents the rudiments of a widely accepted model of investment behaviour based upon the neoclassical theory of the firm. Using this model, one can derive what is called the user cost of capital, a variable that incorporates into one summary expression the influence of all taxes, inflation, and interest-rate parameters facing the firm. In other words, the user cost of capital represents the opportunity cost holding a unit of capital. Thus, it determines the rate of return that marginal investments must achieve to cover costs and thereby determines the amount of investment that will be undertaken.

One factor in the user cost of capital is the cost of finance to the firm, which is the mirror image of the rate of return to the economy's

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savers (the two differ primarily because of personal taxes). The cost of finance to the firm can be thought of as the rate of return that just clears the market for investment and savings.

The PIT will affect the demand for investment and savings if it changes this market-clearing rate. This effect cannot occur, however, in one important set of circumstances. If capital markets are international with free mobility of capital and if the domestic economy produces only a small part of the demand on those markets, the rate of return will be exogenous and will not be affected by the domestic PIT. The analysis of the market for investable funds in open and closed economies is taken up in the third section of this paper.

Even in a world of perfect capital mobility, some assets, such as mortgages, are not traded. The fourth section outlines the sorts of assets that fall into this category and how the PIT may influence them and the investments they are used to finance.

The final section presents a state-of-the-art survey of the integration of the PIT with the CIT. Some provisions of the former, such as the dividend tax credit, are partly intended to integrate the two - that is, to compensate taxpayers for corporate taxes paid on their behalf. The appropriate design of such integration provisions depends upon the structure of the CIT and the role it is intended to play. This subject has been a matter of ongoing concern since the time of the Carter Commission (Canada 1966), and our state of knowledge has improved considerably since then.

THE DETERMINANTS OF INVESTMENT DEMAND

Most analyses of the effects of taxes and inflation on investment have been conducted in the context of a neoclassical theory of investment by the firm.[2] Although the model itself has been derived under fairly strict assumptions, the user cost of capital, which is the main construct obtained, is quite flexible and can be used in a variety of situations. Our discussion takes a long-run, rather than a short-run, perspective. That is, we concentrate on the stock of real capital the firm wishes to accumulate in the long run, given the parameters facing it, rather than on the short-run adjustments it wishes to make to its capital stock in response to exogenous changes in the parameters. This emphasis seems sensible since our main topic is the design or structure of a tax system, rather than tax changes to accomplish short-run stabilization goals.

Basically, the neoclassical theory of the firm rests on the fact that the firm wants to acquire and hold capital goods, provided that the stream of net benefits they generate compensates for all the economic costs of acquiring and holding them. Investment will be undertaken until benefits just cover costs at the margin. The benefits consist of the stream of suitably discounted after-tax revenues generated over all future periods (if the firm is a competitive one, this will be the stream of after-tax marginal-value products of capital). The costs are the imputed economic costs of holding the asset in each period: the cost of finance (debt and equity); any capital losses incurred from changes in the asset's relative price; and the tax savings resulting from the provisions for tax credits or write-offs against income on account of holding the asset.

Aggregating all costs of holding the assets over a given period of time yields an expression called the user cost of capital. Its formal derivation requires the use of a mathematical model,[3] but we can give the non-technical reader a feeling for what is involved by simply outlining the model's structure and results without going through the formal derivation.

The basic model and its variables

Firms undertake a variety of real and financial transactions. The real transactions include the purchase of current and capital inputs and the sale of outputs.[4] The financial transactions include the sale or purchase of debt (or equity in other firms), the payment of interest and dividends, and the issuing of new shares. In addition, the firm pays taxes - income taxes and perhaps others, such as royalties, property taxes, or payroll taxes.

A convenient way to summarize the firm's financial flows is the expression for net-of-tax dividends, an identity derived from the fact that all cash inflows and outflows must balance. For a firm that earns business income only,[5] this expression becomes:

net dividends = total revenues - current costs
- purchase of capital goods + net debt issue
- interest payments
+ new equity issue - taxes.

This expression is useful since the analysis presumes that the ultimate aim

of the firm is to provide its existing shareholders with a stream of dividends and that it plans its real and financial transactions so as to maximize the present value of that stream to them. The discount rate used is the shareholders' discount rate - say, their after-tax return from savings plus perhaps some risk premium required for the particular firm.[6]

The magnitude of each of the items in the dividend expression depends on the firm's production technology, the tax structure, and the stream of prices and interest rates facing it. The production technology determines the output that the firm can obtain, given the inputs that it currently purchases and the capital that it has accumulated. If all its output is sold when it is produced, total revenue is simply the value of total output and the production technology appears as a function in the expression for total revenue. If the firm holds inventories, however, one must distinguish between sales and production, incorporating the inventories of output produced directly into the expression for dividends. Similarly, if the firm holds inventories of the inputs into its production process, one must distinguish between the purchase of inputs and their use.

The model assumes that the firm is able to choose all input and output levels as well as inventory holdings.[7] Another assumption is that the firm behaves as if it knows the future stream of prices, interest rates, and taxes facing it and chooses its inputs and outputs so as to maximize the present value of its stream of dividends. The result is a set of rules that governs its choice of inputs and inventories,[8] from which immediately follow its choice of outputs and sales.

Inputs to the production process

The model distinguishes among the following sorts of inputs the firm can use in its production process - current inputs, depreciable capital, non-depreciable capital, and inventories.[9] For our purposes, it is useful to examine each.

Current inputs

The rule for hiring current inputs is very simple. Since they can be varied in each period, they should be hired each period until the value of their marginal product equals their price. So, for example, for labour,

$$PF_L = w, \qquad (1)$$

where P is the output price, F_L is the marginal product, and w is the wage rate gross of any payroll taxes. Although the output is taxed, the wage rate is tax deductible, so the income tax cancels out and does not appear here.

Depreciable capital

The expression for depreciable capital is somewhat more complicated as it incorporates the complexities of the tax treatment of this input. It can be shown that the real value of the marginal product of depreciable capital is given by:

$$pF_K = \frac{q(r + \delta - \dot{q}/q)(1 - \phi)}{(1 - u)}\left[1 - \frac{ud}{(r + d + \pi)}\right], \qquad (2)$$

where

p	=	real output price
q	=	real price of capital goods
F_K	=	marginal physical product of capital
r	=	real cost of finance to the firm
δ	=	physical depreciation rate
u	=	business income tax rate
ϕ	=	investment tax credit rate
d	=	capital consumption allowance rate
π	=	expected inflation rate.

The firm wishes to accumulate an amount of capital, K, so that equation (2) is just satisfied.

The right-hand side of equation (2) is called the (real) user cost of capital. It is an aggregate of the real opportunity costs of holding a unit of capital for one period. If there were no taxes, it would reduce to $q(r + \delta - \dot{q}/q)$: to hold one unit of capital (i.e., q dollars worth), one forgoes interest of qr, incurs depreciation of $q\delta$, and obtains real capital gains of $\dot{q}$.

The more complicated expression arises solely because of the existence of taxes. It should be noted, however, that one cannot say a priori whether the user cost of capital in the presence of business taxes is

greater than or less than what it would be in their absence. It depends upon the generosity of the capital consumption allowance and the investment tax credit and upon the proportion of financing done by debt (whose interest costs are tax deductible).

The direction of the effect of inflation is also not clear. The appearance of it in the denominator of the term in brackets reflects the fact that the value of capital consumption allowance is reduced in times of inflation because of the use of historic cost accounting. On the other hand, inflation also affects r, the real cost of finance to the firm, and may cause it to rise or fall.

Let us now turn to a discussion of r since it is through this variable that personal taxes are most likely to affect the firm. The cost of finance to the firm, which represents the costs of financing its marginal investment expenditure, depends upon the proportions in which the firm uses debt and equity (retained earnings or new equity) for financing and upon the costs of each of these types of financing. Let us look at the way each appears in the model.

- Debt financing. If the nominal interest rate facing the firm is i, the cost of debt finance is $i(1 - u)$ since interest is tax deductible. If the economy is closed, the value of i is determined by the demand and supply of domestic savings. In this case, the PIT can influence i in two ways. First, it affects the supply of savings directly since the after-tax return to savers is $i(1 - m)$, where m is the PIT on interest. Increases in m may reduce the supply of savings and, therefore, increase i. The PIT may also influence i indirectly in the presence of expected inflation, through what is called the modified Fisher effect.[10] Since the PIT is not indexed, nominal interest is taxed. Therefore, the real after-tax interest rate that savers receive is $i(1 - m) - \pi$. If the real interest rate stayed constant in the presence of inflation, the nominal rate would have to rise by $1/(1 - m)$ times the rate of inflation and the firm's cost of debt would rise by $(1 - u)/(1 - m)$. In fact, so long as investment and savings are interest-elastic, i will not rise this much, but it will rise by more than the rate of inflation. If, however, the economy is open with perfect international mobility of debt and if the economy is small relative to the world, the situation is quite different. Then the interest rate facing firms is likely to be exogenous to the economy and independent of the PIT. (We shall go into more detail on this subject in a later section.)

- Equity financing. Determing the cost of equity finance is somewhat more complex than determining the cost of debt financing because the tax system may treat dividends and capital gains differently. To keep the analysis simple, however, let us suppose the two do bear the same effective tax rate, θ.[11] Let ρ be the after-tax rate of return on equity the equity owners require on the market; ρ may include a risk premium specific to this firm, and it presumably bears a close relationship to i (since equity owners always have the option of holding debt instead). The firm must provide a gross return of $\rho/(1 - \theta)$ to its shareholders; this amount is the cost of equity finance. Notice that this cost, unlike debt-financing costs, is not tax deductible. Thus, if the tax rate rises, the supply of equity funds decreases and the firm's cost of equity finance rises - unless the economy is small and open.

- The overall cost of finance. The firm's overall cost of finance is an average of its costs of debt and of equity finance. If proportion β of the marginal investment is financed by debt and $(1 - \beta)$ by equity, then r, the real cost of finance, may be expressed as

$$r = \beta i(1 - u) + (1 - \beta)\rho/(1 - \theta) - \pi. \qquad (3)$$

As we have seen, increases in the personal tax rate will cause r to rise if savings and investment are interest-elastic. Inflation will cause r to fall if $u > m$ and if savings and investment are interest-elastic, because the value to the firm of nominal-interest write-offs is greater than the cost arising from the taxation of the nominal interest in the hands of creditors.[12] However, as already mentioned, the effect of inflation on the user cost of capital and hence on investment is ambiguous because the influence of historic cost depreciation conflicts with that of the write-off of nominal interest.

When the tax system treats dividends and capital gains differently, the expression for the real cost of finance is more complicated but the qualitative results remain the same. If c is the effective capital gains tax rate, the cost of using retained earnings to finance investment is $\rho/(1 - c)$ while that of new equity issues remains $\rho/(1 - \theta)$. For the record, if a is the proportion of equity finance coming from retained earnings at the margin, then[13]

$$r = i(1 - u) + (1 - \beta)[a/(1 - c) + (1 - a)/(1 - \theta)]$$
$$- \{\beta + [(1 - \beta)(a + (1 - a)\frac{(1 - c)}{(1 - \theta)})]\}\pi. \qquad (4)$$

Non-depreciable capital

Since non-depreciable capital (the most common type is land) is not eligible for a capital consumption allowance, its user cost may be written simply as $q(r - \dot{q}/q)/(1 - u)$. This expression is the gross-of-tax marginal-value product, in real terms, that the firm needs to earn on it. Notice that the expression includes the real financial cost less any real capital gains grossed up by the business tax rate.

All the preceding discussions of r apply here. The tax system impinges in two ways. The business tax appears in the denominator of the user cost and also in the expression for r because of the write-off of interest. The PIT influences r unless the economy is small and open.

Inventory capital

Firms that choose to hold inventories of inputs or outputs incur the costs of financing them. In addition, the benefits of holding inventories (for example, lower costs of production or higher revenues) will ultimately be taxable. In these respects, holding an inventory is similar to holding land. However, the user cost of holding an inventory is different from that of holding land because the tax treatment differs in two ways. First, the use of First-In-First-Out (FIFO) accounting methods for tax purposes means that the inventory cannot be written off at replacement value. Second, partly to compensate for the results of this rule, the tax system allows the deduction from taxable income of an inventory allowance calculated as a percentage of the historic value of the inventories held.

The user cost of inventory is[14]

$$pF_N = \frac{q[r - \dot{q}/q + u(r + \pi)e^{-(r+\pi)T}]}{(1 - u)}$$
$$- \frac{uv[r - \dot{q}/q + (r + \pi)e^{-(r+\pi)T}]}{(1 - u)(r + \pi)}, \qquad (5)$$

where pF_N is the real value of marginal product from holding a stock of

inventories N, q is the real price of inventories, T is the holding period of a unit of inventory, and v is the inventory allowance rate (3 per cent in the present tax system). If T is small (as often turns out to be the case) and if $\dot{q} = 0$, then the user cost simplifies to

$$pF_N = q[r + u(\pi - v)]/(1 - u). \qquad (6)$$

Here, as elsewhere, the business taxes appear in the denominator and also in the expression for r because of the write-off of interest. They also appear directly in the numerator, where the term $u(\pi - v)$ reflects the combined effects of FIFO accounting and the inventory allowance. Notice that this term disappears if the inventory-allowance rate is set equal to the inflation rate. Personal taxes on capital income affect the holding of inventories only to the extent that they influence the real cost of finance, r; this influence is null if the economy is small and open and if capital is mobile.

Taxes and the user cost of capital

As we have noted, business income taxes directly affect the user cost of various kinds of capital: they tax the revenues generated by the output produced from the capital, and they allow write-offs for various costs of holding the capital. If the business tax structure were perfect, these effects would net out and the tax system would be neutral vis-à-vis the investment decision. Such is not the case in practice.

Personal taxes on business income do not affect investment directly. They work only indirectly through their effect on the cost of finance. Even this influence is nullified if capital (debt and equity) is fully available on world markets at exogenously determined rates.

So far the analysis has assumed that the firm is financed directly by individuals. A slight complication arises if it is financed by another firm acting as an intermediary. In this case, the cost of finance to the investing firm is increased by taxes on the intermediary unless the capital income flows freely through the latter. In practice, the flow-through is imperfect for two reasons. First, although dividends in the hands of firms are not taxed, capital gains are; the tax is at half rates, but it can increase the cost of equity finance to the firm. Second, interest is treated differently from dividends. If a firm's acquisition of debt is itself financed by debt, the taxability of the interest received and the deductibility

of the interest paid more or less cancel each other out so the capital income flows through except for the real costs of intermediation. But an asymmetry arises if equity held by a firm is financed by debt (or vice versa). In this case, the dividends are received tax-free but the debt is interest-deductible, so the cost of finance is reduced. This imbalance is a design problem for the framers of the CIT, rather than the PIT.

The other possible source of finance for firms is pension funds and the like, which are themselves tax-free and which also have access to personal income that is tax-free. In this case, the PIT does not directly affect the cost of finance. The greater the proportion of savings flowing through these tax-exempt vehicles, the less the PIT's influence on investment.

Adjustment costs

So far we have been analysing the firm's desired demand for a stock of capital, rather than its current flow demand. If firms could costlessly adjust their stocks of capital, they would do so at each point in time so that the value of the marginal product of capital always equalled the user cost. In general, such continuous adjustment is not feasible. Exogenous changes in prices, interest rates, taxes, and so on occur frequently, so the desired stock of capital rises or falls frequently, sometimes by large amounts. Firms are unable to respond instantaneously and fully. The installation of capital is costly, because it takes time to plan, order, and build, and because it disrupts production processes. Furthermore, the more rapidly firms attempt to invest, the costlier it is to do so.

Economists have attempted to incorporate this phenomenon into the neoclassical theory of the firm through a device called adjustment costs.[15] In the most general formulation of this factor, the value of a firm's output is assumed to depend not only on the quantities of current and capital inputs it employs but also on the level of aggregate investment it is undertaking. The higher the level of investment, given the quantities of inputs, the lower the net value of the output. The reduction in the value of output resulting from an increase in the level of investment is known as the marginal adjustment cost, and it is assumed to rise with investment. The concept of adjustment costs is general enough to cover such diverse occurrences as disruption of production and increase in the price of investment goods due to short-run bottlenecks in supply.

When one introduces adjustment costs into the theory of the firm, the results are straightforward extensions of the expressions we have already examined. Consider the case of depreciable capital, denoting the stock of capital by K and the firm's level of gross investment so that the marginal product of capital, $F_K(K,I)$, just equals the user cost of capital applied to the price of capital goods gross of adjustment costs. That is, if we ignore real capital gains, $\dot{q}$,

$$F_K(K,I) = [q + c(K,I)] \frac{(r + \delta)(1 - \phi)}{(1 - u)} \left[1 - \frac{ud}{(r + d + \pi)}\right]. \qquad (7)$$

The analysis is similar for other forms of investment.

At any particular point in time, given the firm's capital stock and the parameters facing it, equation (7) - or equation (5) for inventories - will determine the level of investment the firm will undertake. It is apparent that the level of investment will vary inversely with the cost of finance to the firm, r.

Summary

At this point, it is worth summarizing what the model reveals about the ways in which the PIT can influence Ontario firms' investment decisions. If the firm is a corporation, the tax rate on business income, u, is the relevant corporate tax rate. Personal taxes do not appear directly in equation (7); rather, their influence is indirect, operating through the cost of finance, r. If the firm is unincorporated, u is the personal tax rate of the proprietor; otherwise, equation (7) remains the same since in Ontario the same tax provisions apply to unincorporated and to incorporated businesses. Thus, in the case of unincorporated businesses, the PIT affects the user cost of finance directly and can be stimulative or otherwise, depending on the generosity of the tax write-offs. In addition, the PIT can affect the cost of financing through its treatment of capital income at the personal level.

THE MARKET FOR FINANCING AND THE INFLUENCE OF THE PIT

The next two sections investigate in more detail the effects of the PIT on the cost of finance and the investment decision and examine their implica-

tions. As a framework, it is instructive to consider a stylized view of the market for savings and investment. We shall present a picture of the aggregate market for savings and investment, ignoring the differences among various sorts of savers (households in various tax brackets, financial intermediaries, pension funds, and so on) and among the various types of capital goods and of firms. In the beginning, we shall also ignore capital flows into and out of the economy, assuming all domestic investment to be covered by domestic savings in equilibrium.

Let us consider first the demand for investable funds to finance investment expenditures, assuming for expositional purposes that the demand is for depreciable capital by a firm. (Obviously, other uses of investable funds could also be considered.) Equation (7) implicitly determined the level of investment for a firm with a given capital stock and facing given parameters. It is convenient to rewrite it as:

$$\frac{F_K(K,I)}{q + c(K,I)} = R(K,I) = \frac{(r + \delta)(1 - \phi)}{(1 - u)} \left[1 - \frac{ud}{(r + d + \pi)}\right] , \qquad (8)$$

where $R(K,I)$ is the real rate of return on investment net of adjustment costs but gross of depreciation. For simplicity, assume that the rates of personal taxes on interest, dividends, and capital gains are all identical ($m = \Phi = c$) and that the market gives savers the same return from debt as from equity.[16] Then $\rho/(1 - \Theta) = i$, so the real cost of finance to the firm is $r = i - u\beta i = \pi$. The real gross return on investment can now be written as

$$R(K,I) = \frac{(i - u\beta i - \pi + \delta)(1 - \phi)}{(1 - u)} \left[1 - \frac{ud}{(i - u\beta i + d)}\right] . \qquad (9)$$

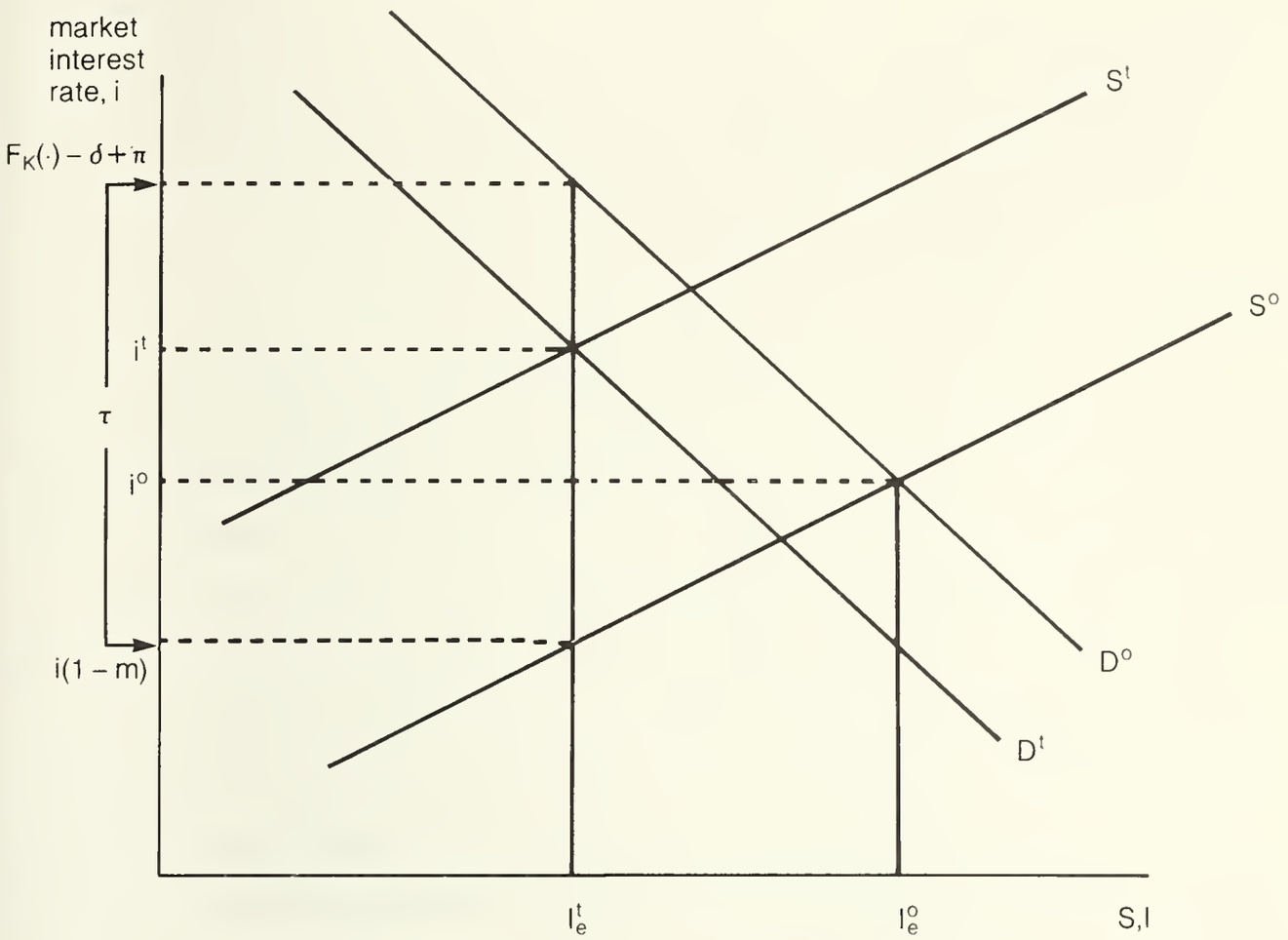
In the absence of business taxes, equation (9) simplifies to

$$R(K,I) = i - \pi + \delta. \qquad (10)$$

From equation (10), we can solve for the levels of investment, I, associated with various interest rates, i, in the absence of taxes. The combinations are shown in Figure 1 as curve D^o.

When business taxes are introduced, the level of investment associated with various interest rates can be obtained by solving equation (9) for I. The resulting investment demand curve is shown as D^t in Figure 1.

Figure 1
Investment and saving, with and without taxes, in a closed economy
τ = effective tax rate



Notice that the diagram shows D^t to the left of D^o, which is where it will lie if the business tax raises the user cost of capital. As mentioned earlier, however, it is possible for the tax to reduce that cost if the system's write-off provisions and investment tax credit are generous enough.

Next, consider the supply of savings. From savings theory we can obtain the supply of savings as a function of the real interest rate required by savers. In the absence of taxes on personal capital income, the supply of savings at various market interest rates is shown by the curve labelled S^o. Assuming, for simplicity, that all forms of capital income are taxed uniformly at rate m, individuals' nominal return from saving is i(1 - m). The amount of saving that would be forthcoming at various interest rates is shown as curve S^t in the diagram.

The intersection of the appropriate demand and supply curves determines the equilibrium rate of interest. In the absence of taxes, the amount of investment undertaken in equilibrium is I_e^o. Once taxes are introduced, investment falls to I_e^t and the market rate of interest becomes i^t, which could be above or below i^o. The amount by which investment falls depends upon the elasticities of the supply and demand curves and upon the magnitude of the tax distortion imposed upon the market.

The effective tax rate

Unfortunately, we have little evidence on the size of the elasticities of the supply and demand curves for investment. It is possible, however, to estimate the size of the tax distortion on the market for investable funds. A value called the effective tax rate, $\tilde{\tau}$, is shown in Figure 1 as the vertical distance between the D^o and S^o curves at investment level I_e^t. The lower point is the net return to savers, $i(1 - m)$, which is obtained from the S^o curve at investment level I_e^t. The upper point is the rate of return to society. From equation (10) we know that the D^o curve shows how $[R(K,I) - \delta + \pi]$, as well as i, varies with the level of investment. That is, it is the curve of the nominal rate of return after depreciation but before tax, which is the rate of return to society. Thus, the effective tax rate is the difference between the rate of return on investment to society and the after-tax rate of return received by savers. It incorporates both the PIT distortion on saving and the business-tax distortion on investment.

We can also obtain the information required to calculate the effective tax rate, at least in principle. One such calculation has been done for Canada by Boadway, Bruce, and Mintz (1984). Their method was to calculate an average tax distortion for the aggregate Canadian economy by subtracting from equation (8) the net-of-tax return to savers. For investment in machinery and equipment, the effective-tax-rate distortion turned out to be about 30 per cent of the gross return to capital. (The calculation did not attempt to separate the contributions of business taxes and taxes on personal income.)

Effects in an open economy

In the example illustrated in Figure 1, we assume a completely closed eco-

nomy. Business taxes shift the investment-demand curve, while personal taxes on capital income shift the supply-of-savings curve. Let us see if these phenomena also occur in an open economy.

Imagine the extreme case in which both debt and equity capital are perfectly mobile internationally and the economy under consideration (e.g., Ontario's) is small. In this case, world capital markets determine some exogenous interest rate (or return on equity), $\bar{i}$, at which non-residents are willing to lend or borrow. The rate of return on domestic financial assets is set so as to yield to non-residents the same net-of-tax return they can receive abroad. It will depend upon the domestic tax system only to the extent that the domestic authorities withhold taxes against capital-income payments to non-residents and that the non-residents cannot credit the withheld taxes against taxes they owe in another jurisdiction.[17] These conditions seem unlikely to be satisfied since most jurisdictions give tax credits for foreign taxes paid. Therefore, it seems legitimate to treat $\bar{i}$ as independent of domestic taxes on capital income.

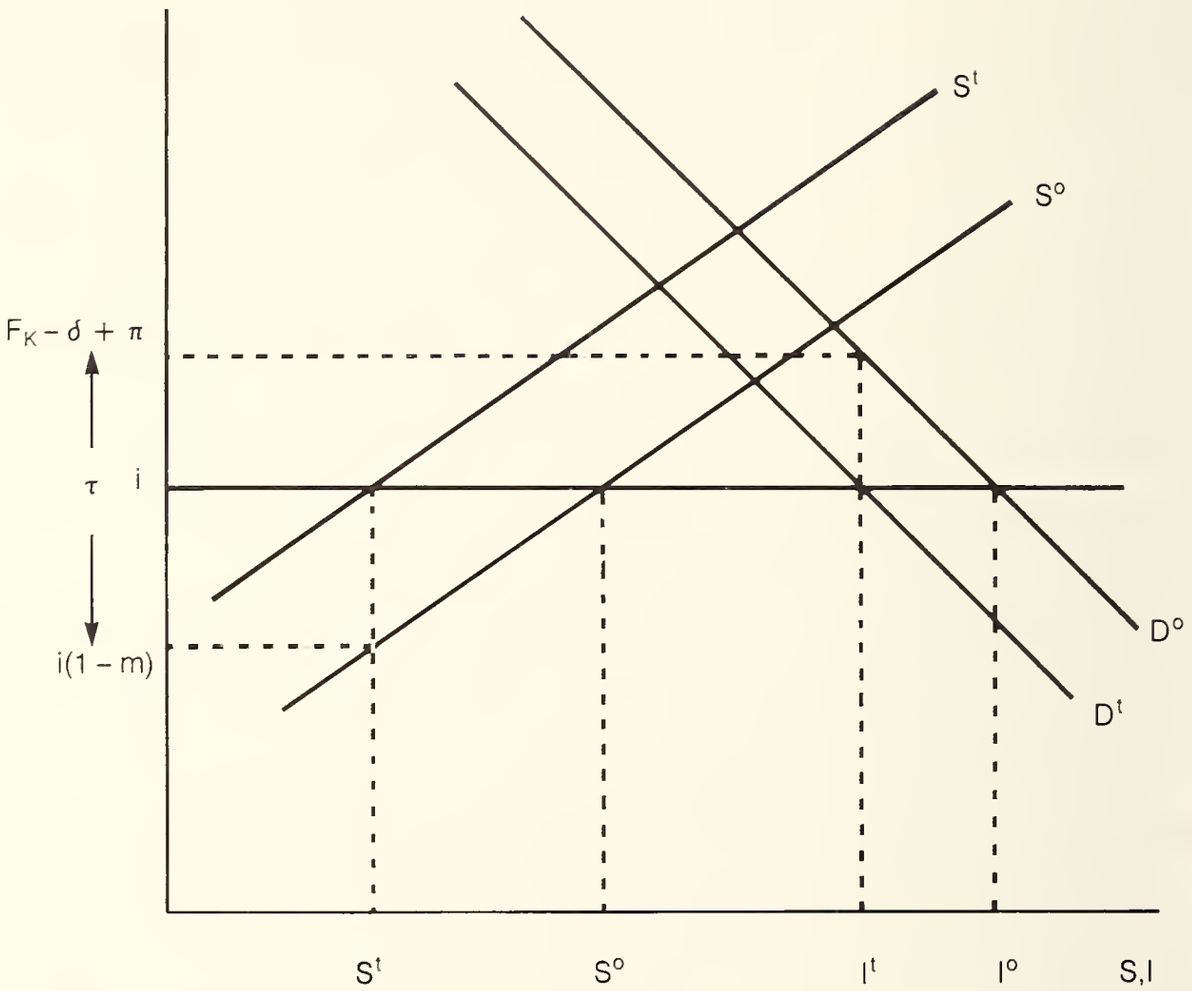
Thus, the openness of the economy alters the analysis considerably. Figure 2 depicts the market for investable funds in an economy that is a net importer of capital. The I^o, I^t, S^o, and S^t curves are defined exactly as before, but now the investment and saving sides of the market are completely separated by the availability of foreign capital and fixed terms. The elastic supply-of-foreign-capital curve intersects with the investment-demand curve, D^t, yielding an equilibrium level of investment, I^t. Likewise, at the market interest rate, $\bar{i}$, equilibrium savings will be that forthcoming at S^t. The difference between I^t and S^t is the capital inflow.

A change in business taxes will shift the D^t curve and thus the amount of investment undertaken; it will not affect savings. A change in personal taxes on capital income will shift the savings supply and thus the amount of savings forthcoming; it will have no effect on the amount of investment.

The effects of inflation

Let us consider briefly the implications of inflation for the investment market in an economy whose tax system is not indexed. Inflation has two influences of interest here: first, it will affect both supply and demand; second, it may cause a transfer of tax revenues between debtor and creditor economies.

Figure 2
Investment and saving in an open economy
τ = effective tax rate



Regarding the first effect, inflation will cause the savings-supply curve to shift by more than the rate of inflation. As we discussed earlier, since the inflation premium is taxed as income, the nominal return to savers must rise by 1/(1 - m), where m is the personal tax rate on nominal interest income times the inflation rate, if they are to receive the same net-of-tax real return. Thus, inflation will cause the savings curve to rise by 1/(1 - m) times the rate of inflation.

On the demand-for-investment side, inflation may also cause a shift, but it may be a rise or a fall. If all investment were debt-financed, firms would get an additional write-off of (1 - u) since nominal interest is tax deductible. On the other hand, the use of historic depreciation works against the firms in inflationary circumstances. Furthermore, not all investment is debt-financed; some is equity-financed and that is not tax

deductible. Therefore, the investment-demand curve could rise or fall in times of inflation. Consequently, whether investment rises or falls with inflation in an equilibrium market is an empirical question.

The same uncertainty exists for an open economy. The effect of inflation on saving and investment here depends upon the shift in the foreign supply curve of investable funds relative to the shifts in the investment and savings curves. No empirical evidence exists regarding the net impact of inflation on the market for funds.

The second possible effect of inflation, a transfer of income between jurisdictions with unindexed tax systems, is potentially important. Consider a creditor country that taxes interest income and a debtor country where interest payments are tax deductible. Residents of the former make loans in the latter. Now suppose the inflation rate increases. In the creditor country, the inflation premium is taxable while it is deductible in the debtor country. If the two countries have the same tax rate, say, m, the market interest rate will rise by $\pi/(1 - m)$. The inflation will leave creditors and debtors equally well off, but real tax revenues will rise in the creditor country and fall in the debtor country.

This phenomenon is a potential source of large revenue transfers between treasuries, be they provinces or nations. The only effective ways to prevent it would be to have full withholding of personal interest income or fully indexed tax systems in both systems. Neither device exists at present. Notice that unilateral indexing cannot eliminate the transfer. Neither can unilateral withholding if the other jurisdiction does not give full credit for taxes withheld.

Summary

To summarize what we have seen about the effects of the PIT to this point, if the economy is closed, the PIT can affect investment in two ways. First, it directly affects the amount of investment undertaken by unincorporated firms. However, since such investment is relatively unimportant compared with corporations' investments, this effect is probably not very important. Second, the PIT indirectly affects the cost of finance by influencing the supply of savings available for investment. This influence disappears, however, if the economy is small and capital funds are perfectly mobile. To put it another way, the less perfectly mobile capital is, the greater the PIT's influence on the rate of return on investment.

If the tax system is not indexed, inflation reduces the supply of savings but may increase or decrease investment demand. It also causes a transfer of tax revenues away from debtor countries towards creditor countries.

THE EXISTENCE OF NON-TRADED SECURITIES

As we have seen, the openness of the economy greatly affects the PIT's impact on the cost of finance. If financial capital is free to flow into and out of the economy, if the economy is small, and if the taxes levied on capital income are fully credited in other jurisdictions, the PIT has no effect on the cost of capital and hence on corporate investment. It only distorts the savings decisions of individuals and influences the magnitude of capital inflows into the economy.

To a large extent, these conditions seem to exist in Ontario. Its economy is small enough that one would expect it to be virtually a price-taker in gross rates of return on those forms of capital that flow freely across borders. The Ontario PIT should have little or no effect on these costs of capital. Even if it does have some influence on the rates of return in some cases, the magnitude of that effect may not be great since a large portion of capital income is sheltered from personal taxes, and since the Ontario PIT only represents about one-third of the total personal taxes collected in Canada.

One would, however, expect the Ontario PIT to have some influence on the cost of financing those kinds of capital whose sources or uses make them less than perfectly mobile across national or provincial borders. (Keep in mind that even if an asset is immobile internationally, its mobility within Canada may preclude Ontario's having significant influence on the rate of return.)

Let us then try to identify some cases in which immobility might exist and, therefore, the Ontario PIT might influence the rates of return. The three that come to mind are the financing of small business, of housing, and of the accumulation of human capital. Each is worth discussing. Notice, however, that much of what follows is pure conjecture. No empirical evidence exists to indicate the magnitude of the potential effects. The presumption we make is that Ontario is a small, open economy unless there is good reason to believe it is not in a particular case.

Small business financing

It can be argued that the market for financing small businesses is segmented and, therefore, that Ontario tax provisions have some influence on the availability and cost of financing this investment. Three sorts of finance are available to firms - debt, retained earnings, and new equity. Small businesses rely relatively more on debt and retained earnings than do other firms.[18] Furthermore, a relatively large proportion of small-business debt takes the form of bank loans, rather than debt instruments sold on the open market. This pattern exists for two reasons. First, small businesses do not have the access to organized equity and bond markets that large public firms have because people in the financial markets simply do not find it worthwhile to devote many resources to acquiring the necessary information about small-scale operations. Thus, external financing is generally more difficult for small firms to obtain and may be more expensive due to the risk and lack of information involved. Much of the external financing they do obtain comes from bank loans; these are often given on a discretionary basis and cannot, therefore, be viewed as traded securities.

The other force at work in the financing of small corporations - one that may account for their unexpectedly large amount of debt - is a strong disincentive to finance by retained earnings that the tax law imposed until the November 1981 budget was brought down. Paying out dividends reduced the firm's cumulative deduction account and thereby extended eligibility for the small-business corporate tax rate. Therefore, many firms avoided the retention of earnings, especially if their cumulative deduction accounts were near the upper limit for the small business tax credit.

The upshot of these effects is that small businesses rely more on bank loans and now on the retained earnings of their owners than larger firms do. The markets for both sorts of finance are segmented or non-existent. There is an element of discretion in the terms available on bank loans. The shares of small corporations are not traded on organized markets, and retained earnings are very much the funds of the individual proprietors or shareholders.

Given these circumstances, it is quite possible that the PIT provisions have some effect on the cost of financing. In the case of bank loans, however, that effect may not be very large. Loans have to compete with

other bank assets, some of which are traded internationally, so the rates of return cannot diverge too much. At the same time, the returns offered on the banks' liabilities (deposits and equity) are probably closely tied to returns on other assets in the economy - depositors always have the option of putting their money to competing uses. Therefore, it is not obvious that bank-loan rates are sufficiently independent of the rates offered on traded assets to be influenced substantially by exogenous factors such as the PIT on capital income. Nonetheless, it should be remembered that banks do not have the same access to sheltered personal income (e.g., pension funds) that other financial institutions do. One could argue that sheltered income gets channelled into larger firms while only unsheltered income is available to small firms. This difference could make the cost of finance slightly higher to small firms.

The PIT could have a stronger influence on the cost of financing through retained earnings than through bank loans because there is no developed market for the shares of small firms. However, one must be cautious here. First, the owners of small firms always have the option of using their funds elsewhere, a fact that limits the amount by which the cost of their equity finance can vary from other market rates. Second, the existing PIT treats small-business income quite generously (at least until the provisions announced in the November 1981 budget come into effect). When a firm pays tax at the small-business rate, the dividend tax credit of 50 per cent overcompensates shareholders for the corporate tax paid on their behalf. Calculations indicate that the cost of finance for small firms is not out of line with that for larger firms.[19]

Housing

The tax system's special provisions for housing mean that the PIT is likely to affect investment in housing, both owner-occupied and rented. (Much of what is said here about housing applies to other consumer durables as well.)

Basically, the income tax system treats equity-financed owner-occupied housing advantageously: the capital income arising from this asset is tax-exempt[20] (neither imputed rent nor capital gains are taxable). Mortgage-financed owner-occupied housing, however, is treated disadvantageously in times of inflation because mortgage-interest payments are not tax deductible, while mortgage-interest receipts are fully taxed and un-

indexed. Thus, the tax system is biased towards equity-financed owner-occupied housing and away from mortgage-financed owner-occupied housing, relative to other forms of investment.

These provisions mean the PIT has a direct effect on housing. It may also have an indirect effect to the extent that its provisions affect the cost of mortgage financing. Mortgages, by their nature, are financial instruments that are not traded internationally. Furthermore, they often make use of sheltered income through RRSPs, pension funds, and the like. Nevertheless, it is unlikely that the cost of mortgage financing can diverge much from the returns on other, traded assets. Suppliers of mortgage money have the option of putting it into close substitutes whose return is dominated by international rates.

The PIT treates rental-housing investment like other sorts of investment, although some special provisions may have some influence on the cost of financing rental units by small firms. The most obvious is the write-off provision for multiple-unit residential buildings (MURB), which allows accelerated depreciation for capital and certain 'soft' costs to be applied against income other than that generated by the MURB. This provision has presumably had the effect of reducing the cost of financing rental units.

If the Ontario government does not like the biases of the tax system that affect the housing industry, there would be some scope for change if it had its own PIT. For example, the PIT could influence mortgage rates if the interest receipts from mortgages on owner-occupied housing were indexed. A large inflation tax is currently levied on such mortgages since interest payments are not deductible from income. Indexing mortgage-interest receipts would drive down the presently high real interest cost of mortgage finance.

It does not, however, appear to be possible for Ontario to change the tax treatment of housing under the existing tax collection agreements, for to do so would involve changing the tax base itself.

Investment in human capital

The present PIT probably discriminates against investment in human capital - for example, investment through education.[21] The returns to such investment are fully taxed to the extent that they show up as wage or salary income, yet not all costs of education are deductible. For ex-

ample, the costs of financing it are not deductible. Moreover, although tuition costs and forgone income are explicitly or implicitly deductible, the value of these deductions is rendered less effective both by the absence of negative tax provisions (when a person is earning no taxable income, he or she has nothing against which to make deductions) and by the absence of averaging devices adequate to offset the large difference between the tax rates that apply during the period of education and those that apply during the period of earning income. The federal government's recent change from a general-averaging to a forward-averaging system makes matters even worse since it effectively precludes using the PIT to average income during periods of education. Nor are self-averaging devices, such as RRSPs, of much assistance here, since negative contributions are not possible. The PIT itself thus appears to discriminate against investment in human capital.

On the other hand, there are other considerations. Not all the returns to education are taxable. Some may be pure consumption benefits. Others may be non-pecuniary benefits associated with jobs for which the human capital is used (including household work). Also, most forms of education are highly subsidized to begin with. Nonetheless, it remains true that the PIT can influence the return to investment in human capital, and any changes Ontario wished to make in this regard could probably not be accomplished unilaterally in the existing system.

THE INTEGRATION OF THE PIT WITH THE CIT

The tax system's treatment of personal capital income is not independent of the view policymakers take of the role of the CIT. That is, if they want the CIT to function as a method of withholding capital income, they must seek some form of integrating device at the personal level. Therefore, in considering what ought to be the appropriate treatment of capital income under the PIT, we cannot avoid looking at the design of the CIT. This issue takes on special relevance in Ontario because the province administers its own CIT.

Let us first outline various views about the role of the CIT and evaluate how the existing CIT compares with these ideal forms. We shall then be in a better position to see how the PIT and CIT can best be integrated.

The role of the CIT

The literature describes two distinct functions for the CIT. It can be designed to tax pure profits or rents generated in the economy, or it can be designed as a device to withhold capital income generated in corporations. Let us consider each in turn.

Much of the economic analysis of the CIT has focussed on its potential as an ideal neutral tax. The literature points out that the tax base for the CIT can, in principle, be struck so as to be the corporation's true economic profits or rents. This situation would occur if the tax base equalled the imputed revenues earned by the firm less the full imputed costs it incurs.[22] In this case, the CIT would be a perfectly efficient tax, falling only on the pure rents generated by natural resources, monopoly profits, immobile factors, and so on. There would be no need to integrate the PIT with the CIT; in fact, giving personal-tax credits for corporate taxes paid would undo the effects of the ideal profits tax.

Imputed costs and revenue are, of course, difficult to value, but an equivalent alternative exists: the corporation's cash flow, properly defined. A tax based on it would also be ideal.[23] Revenues would be included in the tax base when received and cash outlays, including those for capital goods, would be expensed immediately. No deductions would be allowed for interest or depreciation.

Although economists are well aware of the advantages of cash-flow taxation, policymakers have been reluctant to adopt it. Presumably one reason is that although the tax revenues generated under a cash-flow system would have the same present value as those under an imputed-income base, their timing would vary considerably since the tax base would be negative during periods of high investment. Thus, a government that was introducing the system would have to find other financing in the short run.

To the extent that the CIT is viewed as a pure profits tax, it needs no integration with the PIT. However, it seems likely that many policymakers see the CIT largely as a withholding device. The Carter Commission certainly took this view. The use of a tool as cumbersome as the CIT as a withholding device can be justified on two grounds. First, it can withhold at the source capital income that would otherwise flow to non-residents and escape taxation in the economy of origin. If the economy is small and capital flows freely, the withholding of income against non-

resident individuals is ineffective. Since the rate of return they receive in domestic corporations is predetermined, the domestic economy must bear the entire incidence of the withholding tax. This situation does not occur, however, if the non-resident owner is a firm since it will be able to claim a tax credit in the foreign jurisdiction. The withholding tax then represents a transfer from the foreign treasury to the home one.

A second justification for the use of the CIT as a withholding device is that it withholds against the equity owners of the corporation, who could otherwise escape the full effect of the PIT by retaining income in the corporation. (Withholding of labour income against the firm's employees is not necessary since the PIT captures virtually all income generated.)

It should also be pointed out that the case for using the CIT as a withholding device presumes that policymakers wish to tax capital income to begin with. If the personal tax system exempted capital income, there would be no point in having the corporate tax level withhold income from residents. Withholding would only be necessary for non-residents. And as we have seen, the effectiveness of withholding income against non-residents in an open economy is suspect.

Assuming capital income is to be taxed, an ideal withholding system would be one that taxed all capital income generated by the corporation (interest, dividends, and capital gains). To accomplish this, the tax base would have to consist of value-added less depreciation and wages and salaries;[24] full credit would have to be given for corporate taxes on all capital income accruing to residents, which could be done by a system of gross-up and tax credit.

It is apparent that the present tax system falls short of this ideal in several ways. The tax base itself if not correct since depreciation is not allowed at the true economic rate. Moreover, interest deductions are allowed so the interest component of value-added paid to foreigners escapes taxation; this problem is especially important in times of inflation since nominal, rather than real, interest deductions are allowed. Also, the PIT's credit system is far from adequate. No credit is allowed on capital gains (although the lower tax rate on them partly offsets this lack). The credit allowed on dividends are imperfect; the 50-per-cent rate only allows a partial credit on the taxes paid by large corporations but may represent more than full credit for corporations taxed at the small business rate or those given preferential CIT treatment, such as manufacturers, processors, and resource industries. Neither is the dividend tax credit available

on capital income that flows through pension funds.

Thus, the present CIT system fulfils neither the pure-profits-tax role nor the withholding-device role efficiently. It is, in some sense, designed as a mixture of the two functions, although perhaps not consciously. And the PIT is not integrated properly with the CIT.

Reforms to the PIT

Our interest here is not in redesigning the CIT (although it might well be argued that Ontario cannot achieve an appropriately integrated system without reform of both the CIT and the PIT). The issue is rather whether unilateral reform of the PIT is desirable, given the existing CIT. The relevant question here is whether the provisions for crediting of taxes paid at the CIT level are adequate. Some anomalies could be addressed.

First, the absence of credits on capital gains received, on pension fund earnings, and on dividends received from foreign corporations signals gaps in the integration of the CIT and PIT. These gaps are all on the PIT side and could readily be rectified.

Next, it would be sensible to design the integration system so that small corporations and unincorporated businesses are treated similarly for tax purposes. Otherwise, tax reasons alone will continue to provide an incentive to incorporate or to remain unincorporated, as the case may be. This desideratum implies that the CIT for small corporations should be fully integrated with the PIT. Currently, the financial income of small corporations is effectively and fully integrated, but the business income is not since the dividend tax-credit rate of 50 per cent overcompensates their owners for corporate taxes paid on their behalf. In one sense, this outcome is exactly what is wanted. The small-business tax rate is presumably intended to provide small corporations with a special advantage over large ones. If this advantage were partly undone by reducing the generosity of the dividend tax credit (as was proposed in the 1981 federal budget), the provision would be self-defeating. On the other hand, the overly generous dividend tax credit gives small businesses a significant incentive to incorporate for tax reasons. If the government wishes to favour small corporations in its tax treatment, and if at the same time it wishes not to introduce differentials in the treatment of incorporated and unincorporated firms, it has no choice but to use the PIT system to provide the same advantages to unincorporated businesses.

One final issue of special relevance arises because Ontario administers its own CIT. The appropriate PIT provisions for integration depend upon the way in which the CIT is structured. If Ontario wishes its CIT to depart in significant ways from the federal government's, it may also wish to have the independence to amend its PIT so as to achieve the ideal amount of integration. It could do so only if it had its own PIT.

NOTES

1 This study does not consider taxes' macroeconomic effects on investment, that is, those that operate through aggregate demand. Only the relative price effects of tax changes are considered.

2 The book of readings edited by Helliwell (1976) surveys the earlier literature on the neoclassical theory of investment. Much of the recent literature has shifted the emphasis towards the financial side of the firm and the impact of taxes on the cost of finance. The issues are set out in King (1977). Much of the recent work appears as discussion papers of the National Bureau of Economic Research in Cambridge, Massachusetts by Feldstein and his colleagues.

3 Jorgenson (1963) did the original work in this field. For a full discussion of the cost of capital incorporating personal and corporate taxes, see King (1977) and Auerbach (1979). An intuitive derivation is in Boadway, Bruce, and Mintz (1981).

4 There may be a difference between the time at which the transaction is undertaken and the time at which funds are paid or received, giving rise to accounts payable and receivable. The subsequent discussion ignores them, although they can be added to the model with little complication (see Boadway, Bruce, and Mintz [1981]).

5 The treatment of financial income can be incorporated with minor complications (see Boadway, Bruce, and Mintz [1981]).

6 This treatment of risk is not completely satisfactory. For a more formal treatment of the firm's investment decision under risk, see Mintz (1982).

7 The firm can also choose its debt and new equity issue and thus its financial structure. We ignore that part of the problem here since we are focussing on the real-investment decision.

8 These rules are, in fact, the first-order conditions from the firm's maximization problem.

9 Depletable assets should also be included. However, the analysis has not been fully worked out in the literature.

10 For a discussion of the modified Fisher effect, see Darby (1975).

11 In the case of capital gains, this is to be interpreted as the effective tax rate on accrued capital gains.

12 This assumes that the creditors are individuals rather than firms. If the latter is the case, special problems arise if there is not free flow-through of interest and returns to equity.

13 The derivation of this expression may be found in Boadway, Bruce, and Mintz (1981).

14 See Boadway, Bruce, and Mintz (1982b).

15 The original articles on this point are by Lucas (1967) and Gould (1968). A simple geometric treatment is found in Purvis (1976).

Tobin's so-called q theory of investment may be viewed as an application of the adjustment-cost theory of investment.

16 Adding differential rates of taxation adds nothing of substance to the analysis.

17 The interest rate, i, will, of course, depend upon the domestic inflation rate and unexpected movements in the exchange rate.

18 The evidence may be found in Boadway, Bruce, and Mintz (1981).

19 See Boadway, Bruce, and Mintz (1981).

20 A summary of the tax treatment of housing is in Fulton (1982).

21 This view is expressed by Ben-Porath (1967) and by Boskin (1974). An alternative view, that the PIT encourages investment in human capital, is proposed by Heckman (1976). His analysis requires that the PIT depress the rate of interest, thereby raising the present value of the returns to human (and physical) capital investments. This channel does not seem likely in an open economy so we believe, in the absence of empirical evidence to the contrary, that the a priori presumption is that the PIT discourages human capital formation.

22 The argument goes at least as far back as Smith (1963). For a review of the arguments, see Boadway, Bruce, and Mintz (1982a). A detailed treatment of the ideal imputed-income tax base for corporations may be found in Boadway, Bruce, and Mintz (1983).

23 This hypothesis is well known in the economics literature and was dealt with at length in Meade (1978). It is also discussed fully in Boadway, Bruce, and Mintz (1984). Mintz (1982) has shown that cash-flow taxation is ideal in a model involving risk.

24 More details of the ideal withholding tax may be found in Boadway, Bruce, and Mintz (1983).

REFERENCES

Auerbach, A.J. (1979) 'Wealth maximization and the cost of capital.' Quarterly Journal of Economics 93, 433

Ben-Porath, Yoram (1967) 'The production of human capital and the life-cycle of earnings.' Journal of Political Economy 75, 352-65

Boadway, R.W., N. Bruce, and J.M. Mintz (1981) 'The effect of taxation on the financing of large and small business in Canada.' (Ottawa: Economic Council of Canada) Mimeo

- (1982a) 'Corporate taxation in Canada: toward an efficient system.' In Thirsk and Whalley (q.v.)

- (1982b) 'Corporate taxation and the cost of holding inventories.' Canadian Journal of Economics 15, 278-93

- (1983) 'The corporate tax: should it be reformed or abolished?' Report of the Proceedings of the Thirty-Fourth Tax Conference (Toronto: Canadian Tax Foundation) 25-36

- (1984) 'Taxation, inflation and the effective marginal tax rate on capital in Canada.' Canadian Journal of Economics, forthcoming

Boskin, M.J. (1974) 'A note on the tax treatment of human capital.' [US]

National Bureau of Economic Research. Unpublished

Canada (1966) Report of The Royal Commission on Taxation. 6 vol. (Ottawa: Queen's Printer)

Darby, M. (1975) 'The financial and tax effects of monetary policy on interest rates.' Economic Inquiry 13, 266

Friedman, M. (1958) A Theory of the Consumption Function (Princeton: Princeton University Press)

Fulton, P. (1982) 'Tax preferences for housing: is there a case for reform?' In Thirsk and Whalley (q.v.)

Gould, J.P. (1968) 'Adjustment costs in the theory of investment of the firm.' Review of Economic Studies 35, 47-55

Heckman, J. (1976) 'A lifecycle model of earnings, learning, and consumption.' Journal of Political Economy 84, 511-44

Helliwell, J. (1976) Aggregate Investment (Markham, Ont.: Penguin)

Jorgenson, D.W. (1963) 'Capital theory and investment behaviour.' American Economic Review 53, 247-59

King, M.A. (1977) Public Policy and the Corporation (London: Chapman and Hall)

Lucas, R.E. (1967) 'Adjustment costs and the theory of supply.' Journal of Political Economy 75, 321-34

Meade, J. (1978) The Structure and Reform of Direct Taxation (London: Allen and Unwin, 1978)

Mintz, J.M. (1982) '"Neutral" profit taxation, risk taking and optimal profit taxation.' Queen's University (Kingston). Unpublished

Purvis, D.D. (1976) 'Capital and investment: a macroeconomic approach.' Australian Economic Papers 15, 267-76

Smith, V.L. (1963) 'Tax depreciation policy and investment theory.' International Economic Review 4, 80-91

Thirsk, W., and Whalley, J., eds. (1982) Tax Policy Options in the 1980s. Canadian Tax Foundation, Tax Paper no. 66. (Toronto)

The Problems of Financing New, Small Business Ventures

Edwin H. Neave*

INTRODUCTION

This paper studies the problems of financing new business ventures in Canada. It pays particular attention to the effects that asymmetries in information about the distribution of a firm's future cash flows are likely to have on the availability of financing. In this context, we attempt to assess some impacts of an Ontario personal income tax (PIT) on the financing of new, small businesses.

There are many kinds of informational asymmetries. For example, the executive of a financial holding company may have more sophisticated management skills than the executives of the firms they acquire, and financiers generally know more about financial market conditions than do non-financial firms' managers. However, the present study confines itself to asymmetries in information about the distribution of a firm's future cash flows. We assume that the managers of a firm are likely to have specialized knowledge not always available to financiers and hence that managers are usually better informed than prospective financiers as to the firm's distribution of future cash flows. This informational asymmetry appears to account for many of the difficulties associated with financing new, small business ventures.

Informational asymmetries, whether related to cash flows or to other aspects of business operations, are but one kind of market imperfection. Others are also frequently encountered and have theoretical implications similar to those we derive below. However, our principal purpose is to decide whether the classical theory of finance or a more institutionally related theory comes closer to descriptive reality. To demonstrate the

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inadequacy of classical theory, it is necessary to demonstrate the existence of only one kind of violation of the classical assumption of efficient capital markets. Such a demonstration would be enough to establish the position that amendments to the classical theory are likely to be needed when theory is employed as a guide to policy analysis, as it is in this paper.

In other words, we argue that an appropriate theory for analysing the problems of small business finance is one fully capable of taking into account market imperfections of various sorts, but particularly those involving informational asymmetries. We then use a theory developed along these lines to assess the likely impacts of an Ontario PIT on the financing of new, small businesses.

THEORETICAL BACKGROUND

This section briefly reviews the classical theory of business finance. It then explores the effects of informational asymmetries on the theory's standard conclusion. While the theory applies in a general way to both incorporated and unincorporated businesses, it requires modification, as indicated at appropriate junctures below, before it can be used in conducting the analysis in the later sections.

Theory of business finance

The classical theory of business finance holds that firms invest in capital projects up to the point at which each project's marginal internal rate of return equals the firm's (weighted average) cost of capital. (The principle as stated assumes the projects are equally risky; it needs further elaboration if projects of differing risk are contemplated.) The firm's weighted average cost of capital is the effective cost of the funds it raises, a magnitude that must be distinguished from financiers' required rates of return. The cost of funds borne by a firm need not equal the return received by investors if the firm can deduct some financing costs from its taxable income. Moreover, the cost of funds to a firm may include such costs as those to be borne in bankruptcy, and because these costs need not always affect the claims of particular financiers, they will not always be incorporated in the valuations placed by financiers on particular instruments. For example, a bank may offer a secured loan at preferential rates to a company whose survival is questionable.

In a perfect capital market in which no taxes are levied, a firm's cost of capital does equal the financiers' required rate of return on investments of that degree of riskiness. However, if the capital market remains perfect but corporate taxes are introduced, then financiers will be concerned with the after-tax returns relevant to their particular situations, and a business' financial planners will be concerned with the after-tax costs borne by the business. Moreover, these magnitudes may well be different for different kinds of instruments, such as debt and equity.

It might be thought that trading between different instruments would ensure that their after-tax yields to the financiers would all be equal. But market imperfections can inhibit arbitrage, so that in a world with taxes and other market imperfections financiers may not obtain the same after-tax rates of return on different instruments offering comparable risks. Similarly, rates of return may not always be the same, on an after-tax basis, for all financiers who hold a particular kind of security; municipal bonds in the U.S. are a case in point. This is not to deny that financiers will attempt to bring this equality into being, but it is to suggest that such attempts will not always be fruitful. The tax treatment of capital gains and losses can also affect financing decisions. In other words, tax legislation can create instruments that have different effective costs to a given business, and it can create instruments that offer different effective returns to different groups of financiers. This means that businesses will favour certain kinds of financing in an environment with taxes and may seek to obtain that financing only from particular classes of financiers. Hence one question for tax policy is whether the tax environment leads to a higher degree of specialization in seeking sources of funding than might be desirable.

Tax effects are not the only ones to be considered in a world of market imperfections. Even in a perfect capital market a firm's cost of capital depends on the riskiness of the mix of projects it adopts, but in an imperfect market the situation is more complex. In particular, a firm's weighted average cost of capital will depend on the mix of securities it issues. Transactions costs, institutional restrictions, and informational asymmetries will all have impacts on the cost of capital to a business. That is, in an imperfect market a single cost of capital, considered independently of the firm's financing mix, is not always as well defined as it is in the perfect market of classical financial theory.

However, even in these complex circumstances, in which capital mar-

ket imperfections render a firm's decisions about how to structure its financing important determinants of the cost of capital, the firm's investment decisions will still be correctly made if projects are adopted on the basis of whether they will yield a marginal return in excess of their effective marginal financing costs. The appropriate assessment of either marginal returns or marginal financing costs may not be an easy matter, but for the purposes of this section it will be assumed that these returns and costs can be correctly identified.

Moreover, even though projects and the method of their financing interact to affect the value of a business, and even though tax legislation and other market imperfections render the choice of both projects and their financing relatively complex tasks, some general statements regarding the impact of a change in tax policy can still be made. In particular, since businesses will attempt to equate the marginal internal rate of return on a project with the marginal costs of its financing, a reduction in a firm's tax rate can reduce the rate of pre-tax earnings that must be generated in order to provide investors with a given after-tax rate of return. Hence a tax reduction can reduce a firm's effective cost of capital and stimulate it to adopt projects with lower marginal rates of return (for a given degree of riskiness) than it would otherwise adopt.

It is instructive in this connection to revert for a moment to the model of a perfectly informed financial market. In such a market, securities prices would respond quickly to any reduction in taxes, with the result that post-tax rates of return would remain the same. Consequently, a tax reduction would not by itself alter investors' post-tax required rates of return. Moreover, while a tax reduction would improve the wealth positions of existing investors in the affected firms, it would not create extra returns for investors who did not own securities at the time of the reduction. In a world of imperfect information, however, some of the wealth effects of a reduction in effective tax rates might be enjoyed by new investors, since the market might take time to adjust to the new realities.

Consequences of informational asymmetries for financial transactions

So far our theory of finance has suggested that, because of market imperfections, choices of financial structure can affect the value of the firm, as can relations between investment and financing decisions. Moreover,

the securities of the firm will yield the largest proceeds to the firm if they can be sold to those investors who place the highest value on the securities, in part perhaps because they can obtain the highest after-tax rates of return on the securities. In this section we wish to suggest that informational considerations, as well as transactions costs and tax legislation, can have impacts on investors' valuation decisions.

We wish to emphasize these informational considerations because it is possible to argue that they have their greatest impact on the financing of new, small businesses. Hence, when policies likely to affect this class of economic agents are being discussed, a good understanding of the likely effects of informational asymmetries should prove useful in assessing the policies' likely impacts.

By informational asymmetry we mean that different economic agents do not use the same probability distributions in assessing the earnings of a given business. Informational asymmetries are a form of capital market imperfection that can have profound effects on firms' financial transactions. While it is possible to develop the theoretical significance of these asymmetries at some length, just as it is possible to trace at length the manner in which their impacts are registered, for the purposes of this paper it is most important to focus on the likely pervasiveness of informational asymmetries and on their impacts for financial decision-making. By taking this approach, we can outline the context within which firms' decisions are made, and within this context assess the likely impact of changes in tax policies.

Informational asymmetry can explain a variety of financial practices including credit rationing, the use of collateral, restrictive covenants, and preferences for different types of capital structure. That is to say, almost all of the results of traditional financial theory require modification if they are to predict the financing decisions likely to be taken under conditions of informational asymmetry. We now consider each of these practices in detail.

Credit rationing can obtain at equilibrium in financial markets that exhibit informational asymmetries, and higher interest rates will not necessarily reduce the excess demand characteristic of this rationing equilibrium. For, if transactions differ both in riskiness and in the return they yield, and if financiers cannot perceive the differences in riskiness present in alternative transactions, they must make their decisions on the basis of effective yield and average riskiness. Then, if increases in in-

terest rates cause firms to adopt riskier projects than they would otherwise have chosen, increases in interest rates may fail to eliminate the excess demand that can result from financiers making decisions on the bases of both interest rate and risk (Stiglitz and Weiss 1981). The importance of this point, of course, is that if screening risky projects is costly, then the amount of credit available to finance a given class of business may prove to be less than is socially optimal. Moreover, interest rates alone may not serve effectively as rationing or resource allocation devices.

Collateral has no particular role to play in a perfect capital market: it changes the risk class of the transaction, but it has no effect on the capital market line defining risk-return trade-offs. Rather, it simply moves the transaction along the capital market line. In the presence of informational asymmetries, however, collateral provides economically valuable security for a financial transaction. Any informational asymmetries surrounding it do not need to be resolved so long as the value of the collateral is perceived by financiers to be sufficiently great. Because of the asymmetries, funds might not otherwise be available at all. Examples of transactions that involve collateral are residential and business mortgage loans, equipment purchases financed by conditional sales contracts, leasing, and accounts-receivable financing. All of these arrangements obviate or at least reduce the need for financiers to forecast the borrower's distribution of future cash flows, because if the borrower encounters financial difficulty the collateral can be sold to recover the funds advanced.

Restrictive covenants require management to observe certain conditions if financing is to be provided. Some such covenants preserve the collateral held against a loan or investment. Others, however, are intended to ensure that the firm's investment plans will indeed be likely to generate the distribution of cash flows that its financing proposals envision. An example is the requirement that funds extended be used only to finance the capital expenditures proposed in the application for financing. When there are informational asymmetries, restrictive covenants may make it possible to obtain financing which could not otherwise be obtained at or near market rates.

Preferences for certain types of financial instruments can also arise as a result of informational asymmetries. For example, when management's and financiers' estimates of a firm's future cash flows differ, the values

the latter place on particular securities are formed according to their own estimates. That is to say, different securities not only divide up future cash flows in different ways but are valued differently by economic agents who use different distributions to estimate cash flows. Hence even two securities that offer financiers the same after-tax rate of return may not appear to have the same return when they are assessed in terms of management estimates of the firm's future earnings potential. Thus one security may have a market required rate of return that is not in accord with management's perception of the required rate for projects of similar risk. Management will choose to issue those securities that it perceives to carry the lowest required return, after due adjustments for risk. For example, management will prefer debt to equity if financiers are more pessimistic than managers. This phenomenon occurs even when the choice of capital structure is not affected by any other considerations, such as the ability to deduct interest expense from taxable income or to raise funds from different groups of financiers at different effective rates of interest.

To take a second instance of the effects of information asymmetries on securities prices, the same securities can be priced differently in a market in which investor groups differ in their estimates of a firm's prospects, even if management happens to agree with the estimates used by the group purchasing the securities. In such a market it will usually be optimists who hold the firm's securities; in these circumstances it can be shown that the price of the securities is higher than it would be if all investors had the same information.

Interrelations between investments and their financing

We have already suggested that in imperfect markets financing and investment decisions can be interrelated, contrary to the classical theory of finance. These interrelationships can occur for a variety of reasons, but we wish to observe here that informational asymmetries are sufficient to establish them.

Informational asymmetries can have effects on the availability of financing that can be overcome if the investments take a certain form. For example, conditional sales contracts and lease financing of certain kinds of equipment can be obtained by firms for which other types of financing may not be available, because financiers can use the equipment as security for the financing. Financing arrangements of this type are

particularly common with small firms. The rationale underlying such arrangements appears to be that cash flows from particular projects can sometimes be forecast much more easily than the flows for the firm as a whole; moreover, the particular piece of equipment can also be used as collateral to secure the investment. It is, incidentally, interesting to note that this same argument is currently being used to justify a project-financing approach to large, high-risk investment projects.

Moral hazard and adverse selection

Informational asymmetries create conditions under which problems of moral hazard and adverse selection can arise, and these problems in turn create incentives for striking financial arrangements that cannot as a rule be explained by classical financial theory. Again, our purpose is to establish a sufficient basis for not using classical theory as a guide, and the existence of different perceptions is in itself such a basis. Nonetheless, we shall briefly review moral hazard and adverse selection, since they buttress the conclusions we have already obtained.

Moral hazard is present if financiers do not share management's knowledge and if management can use its specialized information to further its ends at the expense of financiers. Setting fire to the insured premises of an almost bankrupt business is one instance of moral hazard; the use of a debt issue's proceeds to finance a riskier investment than the one proposed when the financing was negotiated is another. Among other things, then, moral hazard provides a second rationale for the use of collateral and of restrictive covenants. However, enforcement of these provisos can prove to be difficult and costly.

Adverse selection arises if financiers can make investment decisions only on the basis of clients' average quality. In such cases high-quality clients will find the interest rates on financing transactions to be too high and will avoid them, while low-quality clients will regard the interest rates as low and be attracted in greater numbers than they would be if more nearly accurate screening could be conducted. Among other effects, adverse selection implies that it may be difficult to accurately estimate write-off rates on a particular class of business, a factor that can contribute to credit availability problems.

Thus different patterns of financing can result from the moral hazard or incentive aspects of informational asymmetries as well as from the differ-

ences in beliefs that arise from such asymmetries.

Economics of screening financial transactions

We assume, in accordance with existing theory, that finer screening of investment proposals is carried out at increasing marginal cost. This assumption, together with an assumption of linear returns to the scale of investment activity, is sufficient to show that information-processing yields increasing returns to scale (Wilson 1975). We find it plausible to assume that scale economies to information-processing of different types of financial transactions do exist, and also that the ability to screen a given type of financial transaction is a skill acquired by experience. Skills of this type are not only rare but difficult to communicate; practical knowledge is frequently harder to acquire ('know-how') than theoretical knowledge ('know-why').

To us, these features of the economics of information-processing are sufficient to explain both concentration in financial intermediation and the failure of markets for some types of financial transactions to evolve. The presence of scale economies to information-processing implies that on a per unit basis large numbers of financial transactions can be processed more cheaply than small numbers; hence ceteris paribus there is reason for financial institutions to increase their size whenever such scale economies can be realized. Market failure can occur if the costs of screening are large relative to expected earnings arising from the financial transactions.

If learning by doing is necessary before transactions can be conducted economically in a particular market, the institutions initially present have an economic advantage over potential new entrants. These phenomena, when considered in relation to the relative sizes of the U.S. and Canadian markets, may explain why Canadian financiers have been slower to acquire expertise in such areas as cash flow lending, which American financiers have done well for many years. They may also explain the concentration of foreign investment in some parts of the Canadian economy. It may be that only American financiers have the skills needed to assess some kinds of transactions properly, since the Canadian market is too small for there to be any profit in developing similar skills here. Only in the larger market is it economically rational to acquire them.

Do any of the foregoing observations apply to problems faced in financing new, small Canadian businesses? We think an affirmative answer

might be given when the demand for equity financing is considered. First of all, the screening of applications for equity financing seems likely to be high-cost and subject to scale economies. Second, if assessing the prospects of new businesses in a given industry requires a knowledge of that industry, then Canadian financial institutions may be at a disadvantage, since there may be only a few new businesses in any particular sector that are in need of screening. Third, the small size of Canada's venture capital industry and the nature of its specialization suggest that the markets for these kinds of activities have at least not been perceived as large. In other words, natural barriers to entry, resulting both from scale economies to information-processing and from the costs of acquiring assessment skills, suggest to us that there are strong economic forces contributing to the difficulty of financing new, small businesses in Canada.

Whether or not these difficulties constitute a policy problem remains to be discussed. They do if there are social benefits that have not been realized because of this apparent market failure, and if these unrealized benefits are larger than the costs that would be incurred if policy intervention were to attempt to ameliorate the situation. In particular, for the purposes of the present paper, it must also be asked how a separate Ontario PIT would be likely to alter the situation. We shall turn to the analysis of policy issues later in the paper. Before doing so, however, we wish to examine further what evidence, if any, there is to support the view we are taking. We shall also examine the institutional practices and the existing policy actions that affect the environment within which longer term financing for small business is sought.

PATTERNS OF CANADIAN SMALL BUSINESS FINANCE

This section considers whether the pattern of small business finance in Canada appears to be consistent with the notions, developed above, of a market characterized by informational asymmetries. We shall argue that it does.

Data regarding corporate financing

A recent study by the Economic Council of Canada shows that the use of different instruments by business is a function of the business' size. Small incorporated business uses proportionately less equity financing than

does large business (1982, 21). The Council finds that while debt financing appears to be available to business of all sizes, small and medium-sized firms do have difficulty in obtaining equity financing. While the data refer only to incorporated business, it seems reasonable to assume that small, unincorporated business faces similar difficulties in finding adequate sources of risk capital.

Some reasons for the difficulties

A variety of reasons is usually advanced to explain the difficulty small and medium-sized businesses appear to face in obtaining equity financing. These reasons include regulation, taxation, and the practices of Canada's financial intermediaries. We examine each of these factors in turn, attempting to explain existing practice on the basis of the information-processing considerations we have developed above.

Although financial regulation in Canada is in need of updating to provide consistent treatment for different classes of financial institutions, it does not appear at present to be an important force in restricting equity investment in small or medium-sized businesses.

The Economic Council of Canada cites two possible problems associated with tax policies: capital losses and capital gains are not treated symmetrically, and since financial institutions are only permitted to take limited amounts of loan losses as deductions when calculating taxable income, there may be some incentive for the institutions to favour lower-risk investments. From the perspective of this paper, however, the main problem with taxation policy is what it does not do: tax policy is not used extensively as an instrument to encourage high-risk investments in small and medium-sized businesses, either through the creation of small business investment corporations like those in the United States or through the use of incentive payments to investors in small businesses.

The main reason that private sector financial institutions do not normally make equity investments in small and medium-sized businesses is that they see no profit in it. The fixed costs of information-processing and the costs of learning appear to make equity investment unprofitable. Moreover, the fact that this situation has persisted over many years suggests that these economic considerations are not changing rapidly.

Sketch of private sector financing activities

This section sketches the nature of small business financing activity in Canada and outlines some reasons for this sector's difficulty in obtaining equity financing from private sector sources.

Several kinds of financing are commonly used by new businesses, but for the most part they represent short-term transactions made against the security of liquid assets. Loans can usually be obtained by small businesses, but chiefly for operating purposes; they are secured by liquid assets such as accounts receivable and, in special cases, inventories. Banks do not usually make longer-term investments, not having developed (at least until recently and then primarily in the field of term lending) the skills to complete these transactions. The banks normally require the personal guarantees of the client business' principals when financing is first made available, whether or not the business is incorporated.

Conditional sales contract and lease financing are available to small firms seeking to finance acquisitions of specific pieces of capital equipment. Some capital companies such as Roynat Ltd. provide term loans to businesses, usually by taking mortgage security against the firm's fixed assets. Such loans are available primarily to companies with established operations, rather than to new firms. The provision of these but not other forms of financing is consistent, as we have already pointed out, with the interpretation that the institutions are dealing with the informational asymmetry problems discussed above.

Venture capital companies provide medium-term loan and investment capital to selected firms with relatively high growth and earnings prospects. While they usually extend higher risk forms of financing than do the capital companies, even these investments are usually made in existing growing businesses rather than in new ventures. Again, this practice is consistent with the information-processing considerations discussed above. Because the venture capital industry is closer to developing the skills it needs to make equity investments in new businesses, policymakers seeking to enhance the supply of equity capital would seem well advised to consider using the industry's capabilities to whatever extent is possible.

Sketch of public sector programs

This section looks at existing public sector programs with a view to deter-

mining why they too seem not to have filled the equity financing gap faced by small business. As the Economic Council of Canada has recently pointed out, government financing programs do not appear to place priority on correcting credit gaps or identifying the victims of market imperfections. One reason for this situation is that the criteria used by government agencies are too broad to permit them to focus activities in this way. In addition, the skills of government personnel and the incentives they face neither equip nor motivate them to take on the kinds of risks that must be faced in making equity investments in business.

Loans from the Federal Business Development Bank (FBDB) constitute perhaps the most important public sector source of term financing to new business. Although the FBDB is supposed to avoid competing with the private sector, most of its financing takes the form of term loans secured by mortgages; the FBDB rarely provides new equity financing, although in recent years it has indicated an intention to emphasize this area.

The federal government's Small Business Development Bond (SBDB) program provided incentives for financial institutions to make loans to qualified small businesses. Interest on SBDBs was treated as a dividend payment, so that the banks and other private-sector financial institutions extending the loans would incur no tax liability on their earnings. While the tax savings reduced bond interest costs to the business issuing them, these savings were limited by the fact that the paying firm could not deduct the interest charges from its taxable income. The amount to be borrowed was set between $10,000 and $500,000, to be repaid over a period of one to five years. Eligible businesses had to be incorporated, Canadian owned, and able to qualify for the small business tax rate. This program was recently replaced by a Small Business Bond program available only to firms in financial difficulty.

The federal Small Business Loans Act guarantees the principal amount of loans made to small businesses by eligible private sector lenders. The aim of the program is to help small businesses obtain term credit for improving their operations. Firms can borrow up to $100,000 for capital expenditure at a rate of prime plus 1 per cent. The loans must be secured by land or chattel mortgages.

Other assistance programs include the Ontario Development Corporations, the federal government's Enterprise Development Program (loans and loan guarantees), and Ontario's Small Business Investment Grants (interest rate subsidies). These programs either enhance the availability of debt

financing (which, as we have pointed out, does not currently seem to pose a problem for small business) or subsidize the operations of small businesses (a goal of income redistribution rather than one of dealing with financial market imperfections).

Ontario legislation provides for setting up Small Business Investment Corporations. Individuals purchasing the shares of such a corporation receive a cash grant equal to 30 per cent of the cost of the new equity investment; investing corporations receive a 30 per cent tax credit. To qualify, an investment corporation must invest most of its funds in new eligible small businesses. No investment corporation can own more than 49 per cent of any single small business. Providing the incentives prove to be sufficiently large, this kind of vehicle should help close the equity financing gap, although it assists only incorporated small businesses.

Quebec investors may claim a tax deduction against the amount of funds used to buy shares in certain Quebec corporations. In addition, residents of Quebec can form small business development corporations similar to those that can be formed in Ontario. For many years, small business investment corporations receiving favourable tax treatment have been permitted under U.S. legislation, and considerable amounts of funds have been channelled into new businesses through these vehicles. Like the Ontario legislation, these incentive programs do offer means of dealing with the financial market imperfections we have been discussing.

POLICY ISSUES

We have seen that Canadian small business seems to face an equity financing gap whose existence can be explained by informational asymmetries, information-processing costs, and other financial market imperfections. While we cannot establish definitively that the social benefits of closing this gap would exceed the costs of closing it, we think there is a case for policy experimentation with means of providing additional equity financing to small business. Thus we favour initiating programs to encourage such financing, but would subject the programs to review in order to ensure that they were both benefiting the target client group and generating benefits in excess of their costs. Should program reviews show that these goals are not being met, then the experimental programs ought to be discontinued. But the value of such programs cannot be assessed without experimentation; data are not available to permit analysis of the costs of

investments that do not get made.

Policies for dealing with informational asymmetries

We have argued that much of the problem associated with equity financing of new business is a matter of overcoming the informational asymmetries between financier and client. Moral hazard and adverse selection problems complicate the picture. One way of dealing with these problems is to create a close, continuing relationship between financier and client, such as through the venture capitalist's taking a seat on the board of the client firm. This procedure allows for learning how to administer the financial transaction as time passes, as well as for discovering if the business is being run honestly and competently. Unless a program is run in this way the difficulties of equity financing are unlikely to be overcome. Hence our advocacy of using investment corporations or venture capital firms to administer the transactions. As already noted, subsidies may be needed to induce the private sector to undertake the transactions, and also as noted, such subsidies can be justified only if they generate social benefits.

Possible new policies for aiding small business finance

The issue of primary concern in the present study is the relation between an Ontario PIT and the financing of new, small businesses. As we have seen, small business seems to face an equity financing gap (or, in the case of unincorporated business, difficulty in raising risk capital), and consequently the PIT proposals need to be assessed in this light. It is also useful to contrast the effects of tax policies with those of other kinds of policy actions.

Use of the tax system

The tax system can be used to encourage risk financing by providing incentives for individuals or businesses to invest in new, small businesses. Similarly, additional taxes imposed on individuals or businesses will have disincentive effects. Clearly, the kinds of disincentives depend on the nature of the taxes imposed. In the case of an Ontario PIT, the disincentive to invest in new business would probably be small. Moreover, it could be offset in part by giving taxpayers credits for their share of

corporate taxes paid. Administration of such a scheme would likely be difficult, as we discuss below.

Obviously, any increase in personal income tax will reduce individuals' ability to save. Interest rates may rise slightly unless other supplies of saving appear. Given a rise in Canadian interest rates, such additional supplies of savings are likely to be forthcoming from foreign investors if no additional domestic supplies appear. But these possible aggregate supply and incremental interest rate effects are not likely to be significant impacts of a change in personal income taxes.

In a fragmented financial market, the significant effect of a PIT is likely to be an impairment in investment in small, closely held businesses financed by owners and their close associates. For in a fragmented financial market - and we have argued that informational asymmetries do fragment this market - much of the financing available to small business of all types comes from owners; few if any substitutes are likely to be found. It will be recalled, moreover, that the incentive programs designed to stimulate equity investment in new, small businesses are only targeted at incorporated business and do not affect the provision of risk capital to unincorporated enterprises.

One way to offset some of the effects of a PIT would be to award individual taxpayers resident in Canada full credit for their share of corporate income taxes. Todd and Hartle (1983, 412) show that such an arrangement might bring about a 75 per cent increase in investors' after-tax returns on equity investments. To the extent that the tax credits did give investors larger returns than they would have otherwise received, the effect of the program would be to increase the amount of capital formation, since a firm's return on investment would be able to fall without reducing the return to investors from its level before the program came into effect. In other words, a firm's required rate of return could decrease, and yet the firm could continue to meet its investors' required rate of return. Nevertheless, such a scheme would not likely be nearly as effective as one that provided investors with direct incentives to invest in new, small businesses. Nor is it clear that a reduction in a business' required rate of return is useful or desirable. The scheme would offset some effects of a PIT, but those effects could also be offset by the investment credit programs we discussed earlier, and those programs have more promise in terms of dealing with the equity financing gap.

There are some further objections. Not all of the effects of a tax

credit policy are likely to be desirable. In a fragmented market, neither the incidence of the tax nor the credit scheme would be likely to be as even as they would be in perfect financial markets, because in the markets under discussion arbitrage is not easily carried out. Moreover, only investors in firms with taxable profits would be able to realize the credits, and yet some new firms without taxable profits might eventually prove to be of value to the economy: many viable small firms do not earn taxable profits during their first few years of operations. The tax credit scheme would only help this class of business if unavailed tax deductions could be sold in the marketplace, as they are in the United States. However, selling the deductions can have the final effect of subsidizing not only firms that are likely to show a profit eventually, but also firms that have no real hope of becoming profitable. Finally, administration of the scheme would seem to be a relatively complex undertaking.

Other policy vehicles

Whether or not a separate Ontario PIT is imposed, policies other than a tax credit scheme would work better to bridge the equity financing gap that confronts new, small businesses. As the analysis has already suggested, these alternative measures could be either subsidies to the private sector or the use of loan guarantees to absorb some of the risk the private sector would otherwise absorb. Again, such schemes should of course be entertained only if it is reasonable to expect that the social benefits of the program will more than offset its social costs.

Clearly, firms can overcome high financing costs or lack of credit availability if they can provide collateral to secure any funding they may require. A program of government-underwritten loan guarantees would place borrowers in the same situation as they would be in if they had such collateral, and hence offers one possible way of overcoming the effects of market fragmentation. A loan guarantee program could well prove cheaper to administer than a program of direct lending by government financial intermediaries, and of course it would require less fund-raising activity on the part of government. In administering a public sector loan guarantee program, it is important to ensure that the private sector continues to bear some of the loan loss risk; otherwise the care with which the private sector screens applications would be impaired. The main problem with an appropriately administered loan guarantee program is that it would not

address the issue of the risk financing gap.

Subsidies could be given to private sector financiers to help them overcome the high costs of screening in areas where these costs impede the ability of small business to obtain financing. This policy alternative may be preferable to direct government lending because private sector financiers may be better at taking on risks than their public sector counterparts. Private sector financiers can earn rewards proportional to the risks they undertake, while employees of the public sector are not so motivated and indeed would wish to avoid the public criticism that would accompany the losses (and some would be inevitable) that resulted from following a high-risk lending policy. For no matter how many successful ventures were financed, public commentary would be likely to focus on the failures. Again, the Ontario and Quebec programs do provide intermediaries with some incentives, based on the features of taxation policy, to package equity investments; improvement in these programs is likely to prove far more effective than offsetting the effects of the PIT through an alternative tax credit scheme.

CONCLUSIONS

The effects of a PIT on the small business equity financing gap are likely to be modest, and there are objections to offsetting the effects of a PIT through a tax credit program based on rebating a share of corporate income taxes. A scheme that subsidized the private sector to make these equity investments would be administratively simpler and much more likely to reach the target market of small business equity financing.

REFERENCES

Donaldson, Gordon F. (1980) private conversation, Harvard University

Downes, David H. and Robert Heinkel (1982) 'Signalling and the valuation of unseasoned new issues.' Journal of Finance 37, 1-10

Economic Council of Canada (1982) Intervention and Efficiency (Ottawa)

Figlewski, Stephen (1982) 'Information diversity and market behaviour.' Journal of Finance 37, 87-102

Giammarino, Ronald M., and Edwin H. Neave (1983) 'The failure of financial contracts and the relevance of financial policy.' Working Paper, Queen's University

Stiglitz, Joseph, and Andrew Weiss (1981) 'Credit rationing in markets with imperfect information.' American Economic Review 71, 393-410

Todd, John, and Douglas G. Hartle (1983) 'The TAX-2 model and results.' In Hartle et al. A Separate Personal Income Tax for Ontario: an Economic Analysis (Toronto: Ontario Economic Council)

Wilson, Robert (1975) 'Informational economics of scale.' Bell Journal of Economics 6, 184-95

The Impact of Taxes and Transfers on Labour Supply: A Review of the Evidence

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The impact of taxes and transfers on work incentives has long been a matter of concern to policymakers, but until the last decade there has been little research on the actual magnitude of the disincentive. In the late 1960s, the United States government began releasing microeconomic data to researchers, and for the first time researchers were able to estimate the parameters of the theoretical model of labour supply. Soon thereafter income maintenance experiments provided a different type of data. This paper surveys the empirical labour supply literature and attempts to explain the variations in estimates. It offers some conclusions about the most likely labour supply responses and discusses implications of these responses for tax and transfer policies.

THEORY OF LABOUR SUPPLY

The basic model of labour supply assumes that an individual is allocating his time between work and leisure in a given period of time, such as a year. The worker is assumed to be able to work as much or as little as he or she desires at a given wage rate. The worker maximizes utility, which is a function of leisure and income, subject to a constraint that depends on the total time available (T), the wage rate (W), and his non-wage income (Y). In Figure 1, the budget constraint facing a worker is ABC, and he chooses to work T-L hours and enjoy L hours of leisure. A level of utility equal to U_2 is attained.

If a worker has a reduction in his wage rate, to W' for instance, the constraint becomes ABG in Figure 1. In Figure 1 the worker chooses

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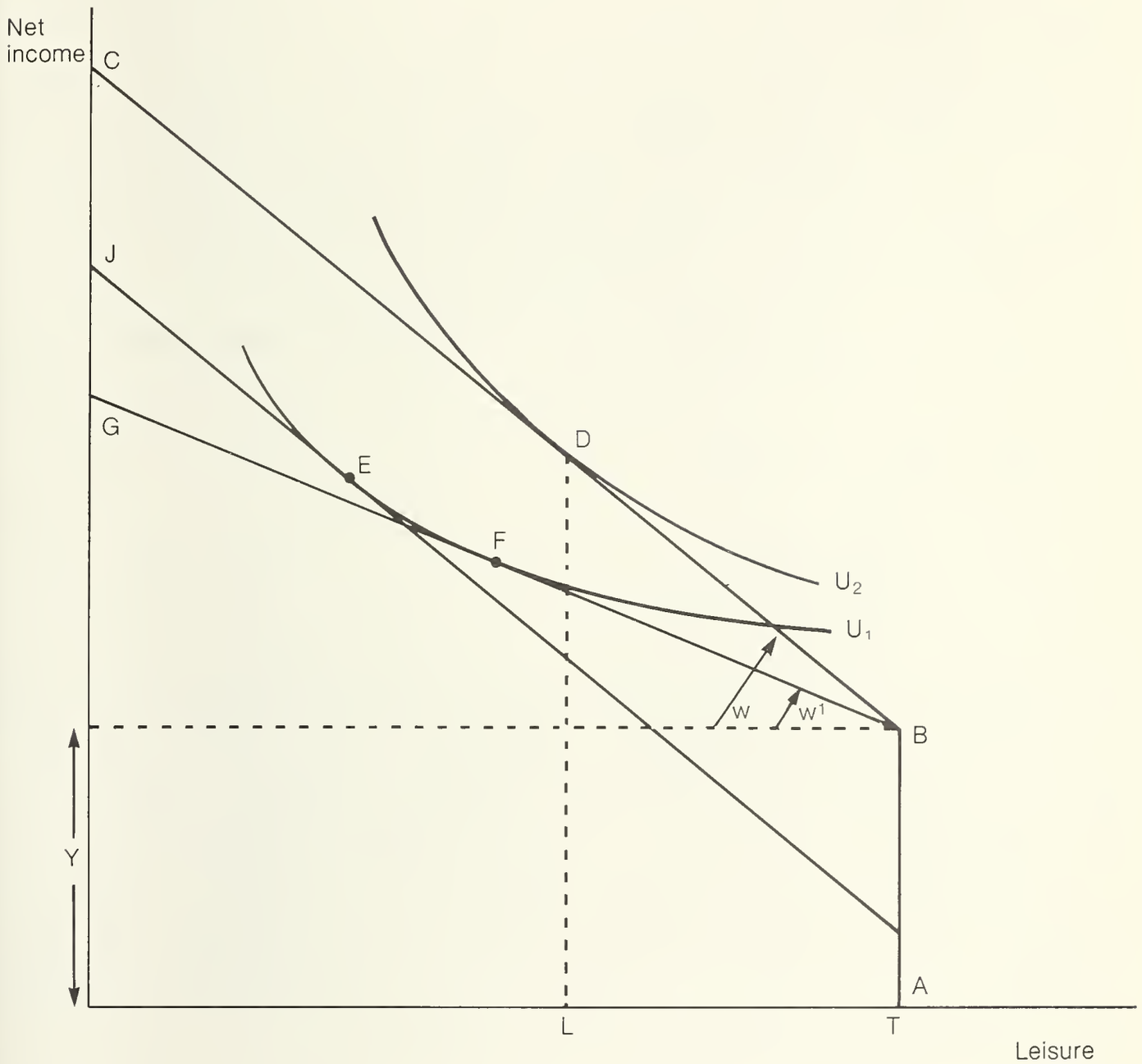
Figure 1
Response to a wage change



point F and increases his work. This response to a wage decrease is the net result of an income effect from D to E and a substitution effect from E to F. The wage reduction reduces the attainable income, just as if non-wage income had fallen by CJ. The income effect is the response to such a decrease in income. If leisure is a good that is consumed in increasing quantity as income increases (a normal good), a reduction in income reduces the demand for leisure. On the other hand, the lower wage reduces

the returns to work and makes leisure less expensive, inducing a substitution of leisure for goods and services. This substitution is represented by the movement from E to F along the indifference curve with utility level U_1. The movement from E to F is also called the response to a compensated wage change. The supply of labour may increase or decrease in response to wage changes, depending on the relative size of the income and subsitution effects. Given the way in which the indifference curves were drawn in Figure 1, the income effect dominates the substitution effect, and reductions in wage rates induce increases in labour supply. This inverse relationship between the wage rate and labour supply is called a backward-bending supply curve for labour.

The income and substitution effects of a change in the wage rate can be expressed mathematically as follows:

$$\frac{\partial H}{\partial W} = \left[\frac{\partial H}{\partial W}\right]_{\bar{u}} + H \left[\frac{\partial H}{\partial Y}\right] \qquad (1)$$

H = hours worked
W = wage rate
Y = non-wage income
$\bar{u}$ = utility held constant

The first term on the right-hand side is the substitution effect and the second term is the income effect. If the income effect, which is likely to be negative, exceeds the (positive) substitution effect, the supply curve will be backward-bending. It will be shown below that in order to simulate the impact of income taxes one needs estimates of $\partial H/\partial W$, which I call the wage coefficient, and $\partial H/\partial Y$, which I call the income coefficient. However, for purposes of comparing the results of alternative empirical studies of labour supply, it is useful to convert equation (1) to elasticity form by multiplying both sides by W/H.[1] This gives:

$$\frac{\partial H}{\partial W}\frac{W}{H} = \left[\frac{\partial H}{\partial W}\right]_{\bar{u}}\frac{W}{H} + W\frac{\partial H}{\partial Y} \qquad (2)$$

or

$$e_w = (e_w)_{\bar{u}} + W\frac{\partial H}{\partial Y} \qquad (3)$$

e_w = Wage elasticity (uncompensated)

$(e_w)_{\bar{u}}$ = Compensated elasticity (i.e., utility held constant)

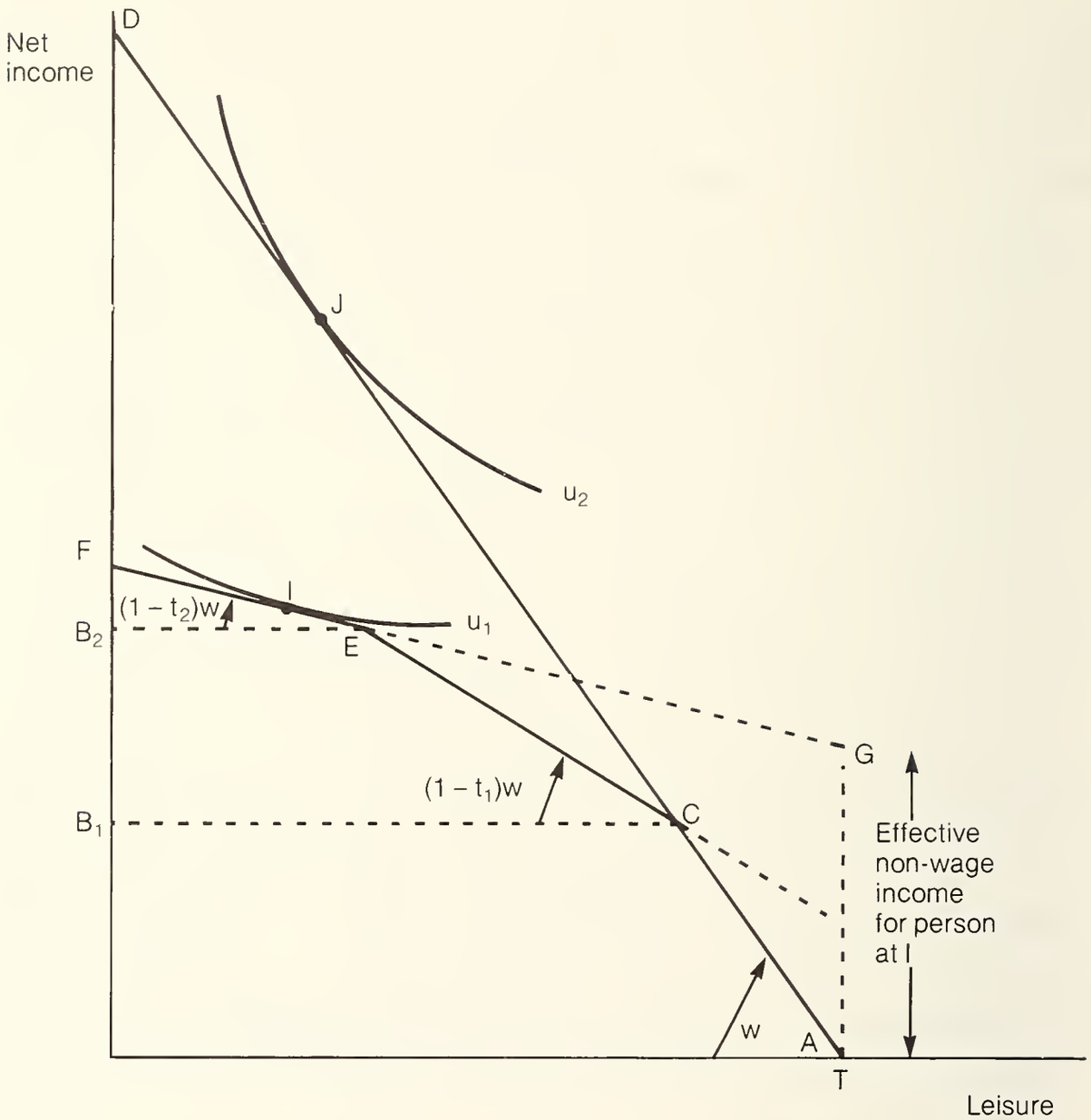
Note that the second term is the marginal propensity to consume leisure, $-W(\partial H/\partial Y)$, with the sign changed.

Income taxes alter the budget constraint in the same way that changes in non-wage income and wage rates affect the constraint. A simple proportional income tax has the most straightforward impact. For example, a proportional income tax of 20 per cent lowers the net wage by 20 per cent and induces a change in work (an increase in the example in Figure 1), just as if the wage had fallen by 20 per cent. For those with non-wage income, the proportional tax reduces non-wage income by 20 per cent, inducing an increase in work if leisure is a normal good.

The effect of progressive taxes on the returns to work is more complicated. Nevertheless, it can be reduced to two fundamental components: a change in the 'effective' wage rate and a change in the 'effective' non-wage income (Cohen, Rea, and Lerman 1970). Figure 2 represents a simple progressive tax system. The budget constraint in the absence of taxes would be ACD. The tax system is assumed to have a zero tax rate on income less than B_1, a tax rate of t_1 on income between B_1 and B_2, and a tax rate equal to t_2 on income over B_2. The new constraint is ACEF, which reflects the decreasing marginal return to work. The constraint with taxes is complicated, but for the person on a given segment, such as EF, the only relevant part of the overall constraint is the one he is on. For each tax bracket, the relevant constraint can be expressed in a linear form that makes it comparable to the simple constraint in Figure 1. For example, if someone is in the highest tax bracket in Figure 2, along EF, the 'effective' constraint is GEF. The worker in the highest tax bracket would act as if his non-wage rate were $(1-t_2)$ W, called the effective wage. The effective non-wage income at a given gross income level, I_0, can be shown to equal: (marginal tax rate at I_0 - average tax rate at I_0) x I_0.

In order to see the usefulness of the effective wage and non-wage income approach, consider a taxpayer with a gross income of $30,000 in earnings. If one assumes only the standard deduction, the 1981 federal and Ontario taxes are $7,520, the marginal tax rate is 38 per cent, and the average tax rate is 25 per cent, giving an effective non-wage income equal to $3,900. (If the taxpayer had some actual non-wage income, the after-tax value, calculated with the marginal tax rate, would be added to this amount.) The impact of eliminating the progressive tax in the case of this individual can be calculated if one knows the response to a 61 per cent increase in the wage rate (from .62W to W) and a $3,900 decrease in non-wage income. Such a change would induce him to move from I to J in Figure 2.

Figure 2
Progressive income tax



The impact of taxes on labour force participation (the decision to be in the labour force) depends on whether there are fixed costs of working (see below) and whether there is a tax on the first dollar of earnings. If one assumes that there are no fixed costs, the progressive tax in Figure 2 would not affect labour force participation because the marginal return to work is unchanged at A, where hours of work equal zero. If the tax system affected net earnings at this level of income, participation would be lowered. The Canadian tax system exempts approximately $5,000 in earnings from tax, but secondary workers in a family face higher marginal rates on low levels of earnings. The first $505 of the secondary worker's

income (in 1981) is tax exempt.[2] Thereafter, the secondary worker is taxed at the spouse's marginal rate until the marriage exemption is eliminated.

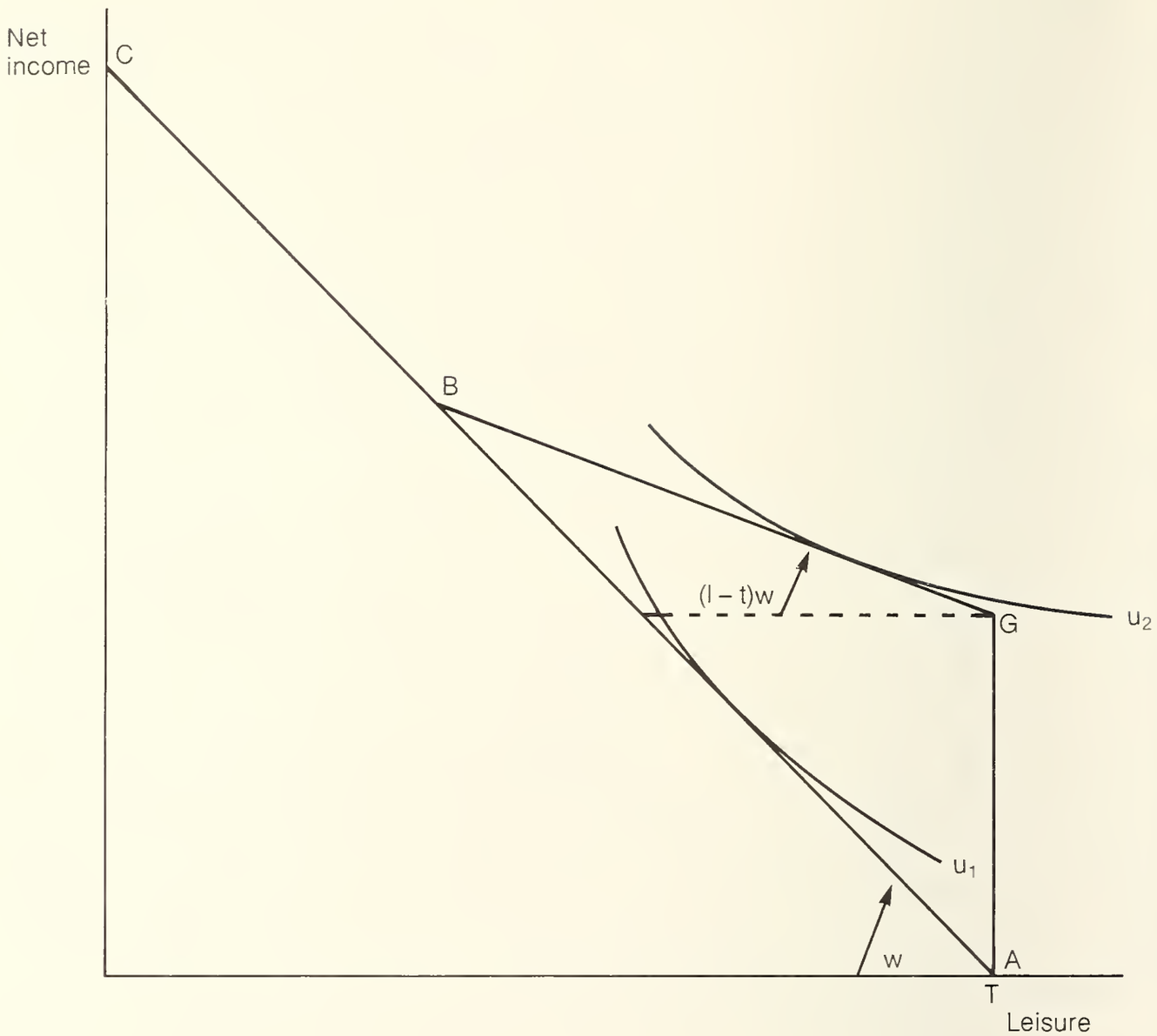
Fixed costs of working, whether in time (commuting time, for example) or income (commuting costs, for example), shift the budget constraint down and increase the probability that the worker will withdraw from the labour force. For those who remain in the labour force, fixed costs will induce increased work. When fixed costs of work are present, taxes may reduce labour force participation whether the first dollar of earnings is taxed or not. It seems reasonable to assume that in Canada the fixed costs are large enough that the secondary worker's participation will be affected by taxes. Primary workers will probably not be affected.

The labour supply response to income maintenance programs can be evaluated in the same way as the response to taxes. A negative income tax (NIT) is the term used to describe a broad-based transfer program, but in fact every income-tested transfer program has the same basic structure as a negative income tax. The simplest way to transfer income to those who have low income is to provide a guarantee, G, for those with no other income and to reduce the benefit by a 'tax-back' rate, t, multiplied by income from other sources. For example, a program might pay $5,000 (G = 5,000) to those with no income and reduce the benefit by 60 per cent of income from other sources (t = .6). Someone with $1,000 in earnings would receive $4,400 in net benefits, or a total income of $5,400. Anyone earning less than $8,333 (this equals G ÷ t) would receive some benefits. This amount is called the break-even point.

Figure 3 illustrates the impact of a NIT on labour supply. In the absence of a program the constraint is ABC. The NIT offers a guaranteed income equal to AG if the recipient does not work. If he works, the benefits fall by a fraction t of the recipient's earnings until the benefits are exhausted (at B). The constraint that the recipient faces is AGBC. For someone initially along AB, the program reduces the marginal return to work and increases income. Therefore, both income and substitution effects lead to a reduction in work. For predicting the change in work it is useful to treat the recipient as if he had an effective wage equal to (1-t)W and an effective non-wage income equal to G.

Some misunderstanding surrounds the issue of whether it is the compensated or the uncompensated wage effect that is relevant for the analysis of taxes. It is possible for taxes to increase actual labour

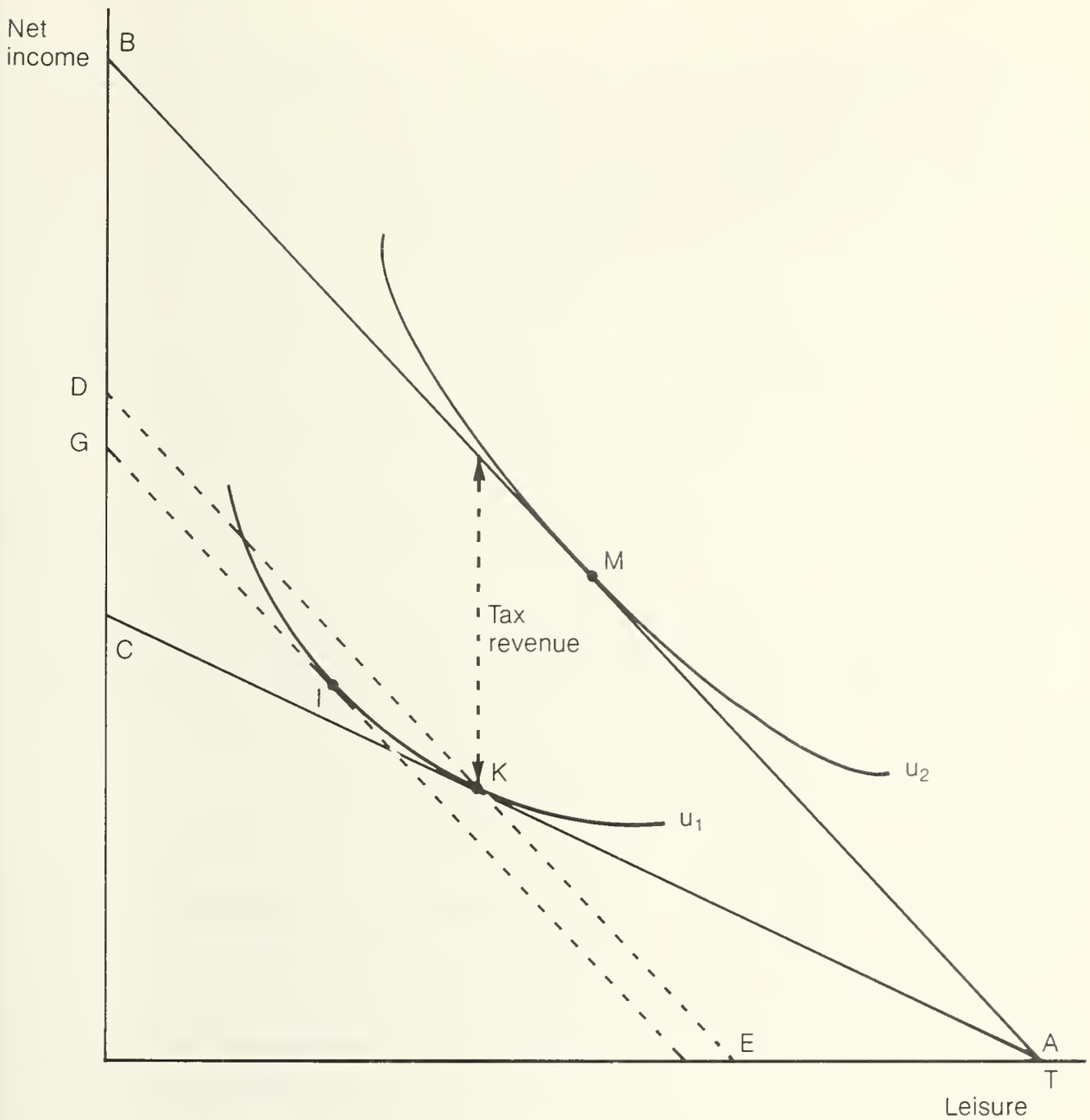
Figure 3
Negative income tax



supply. For example, with a backward-bending supply curve a proportional tax would increase work. However, there would still be a deadweight loss associated with the marginal tax on work. That is, the cost of raising the revenue (in terms of the lost utility of the taxpayer) would exceed the value of the revenue raised. In other words, a lump-sum tax that did not distort the marginal rate of substitution between work and leisure would collect the same revenue and leave the taxpayer better off.

Figure 4 illustrates the deadweight loss for a proportional income tax, assuming that wage reductions increase work. The initial budget constraint is AB, and the worker chooses point M. The proportional tax increases his work, and he chooses point K. Alternatively, given a lump-

Figure 4
Deadweight loss



sum tax equal to BD, the constraint would be DE and he would be better off. The lump-sum tax could collect more revenue than the proportional tax without making the taxpayer worse off. A lump-sum tax equal to BG would give the taxpayer the same level of utility (compare I and K) and would raise DG in additional revenue. The loss associated with the non-lump-sum tax is called the deadweight loss. Its magnitude depends on the substitution effect and the size of the marginal tax. An approximation of

the loss (Hicks 1946, 331) is

$$\tfrac{1}{2}\left[\frac{\partial H}{\partial \overline{W}}\right]_{\bar{u}} (tW)^2.$$

Note that the loss goes up with the square of the tax rate.

An estimate of the substitution effect is required if one is to estimate the deadweight loss. The substitution effect may also be the relevant measure of the impact of taxes if one is only interested in labour supply. Some government expenditures will provide real goods and services to taxpayers that will have an income effect that reduces work. If the taxpayer values the benefits at their cost, and if he receives benefits independently of his income equal to the taxes he pays, the income effect of the tax is eliminated, and all that is left is the substitution effect.

A second reason for concentrating on the substitution effect is that income taxes may be used to finance income-tested redistribution programs. The taxpayer's loss of income is a gain in income for the income maintenance recipient. If the income effects on work are the same for both groups, the net impact is a substitution effect that reduces work for both groups.

EVIDENCE

The evidence on labour supply consists largely of studies that ignore taxes, but there are a few studies that incorporate taxes. Given the difficulty of incorporating taxes in a model that can be estimated, I shall consider the estimates that do not incorporate tax effects directly, as well as those that do incorporate taxes. The purpose of this review of the evidence is to determine if there is any consensus concerning income and substitution effects.

The review of the evidence begins with a discussion of the econometric problems associated with cross-section estimates of labour supply. This discussion explains some of the diversity of estimates and the types of biases that are inherent in each type of technique.[3] Subsequent sections will review studies based on panel data, time series, and experiments.

My summary of the research focusses on two groups, men and married women. Married women are treated separately because they traditionally

have had a choice between working at home and in the marketplace. Unmarried women are likely to respond in the same way as men, and unmarried heads of families will likely fall somewhere between men and married women.

Cross-section estimates

The vast majority of labour supply studies are based on a cross-section of individuals. Most of these studies are based on U.S. data, since micro-economic data were not available in Canada until relatively recently. The cross-section estimates of labour supply functions are plagued by numerous difficulties because of data limitations and econometric problems. The estimation problems that have the greatest impact on the estimated wage and income coefficients are reviewed below.

Estimation problems

Functional Form. The labour supply model tells us that hours supplied are a function of the wage rate and non-wage income, and equation (1) tells us how the wage coefficient can be decomposed into income and substitution effects. Unfortunately, the theoretical model does not suggest an obvious functional form for representing the utility function or the labour supply function. In an earlier work, I estimated the labour supply function with a set of dummy variables that allowed for any shape of labour supply function (Rea 1974), but this approach has many disadvantages. Because of the complexity of the econometric technique designed to deal with other problems (see below), most current research assumes a linear supply function or assumes a specific utility function with a very restrictive form. Most researchers have assumed that if demographic variables are held constant, the labour supply function is a linear function:

$$H = a + bW + cY \qquad (4)$$

This function eliminates the possibility of a backward-bending supply curve that is positively sloped at low wage levels. In addition, the function is theoretically awkward, since it assumes constant wage and income coefficients. The theory suggests that the wage coefficient de-

pends in part on hours worked.

Errors in Measurement of Wage Rates. One of the most severe problems confronting early research was the lack of an adequate method for measuring the wage rate. In many surveys it was necessary to divide the reported earnings in the previous year by an inaccurate measure of hours worked during the year in order to derive a wage rate. When a regression is run with hours worked as the dependent variable and the wage rate as an independent variable, errors in the measurement of hours will cause the wage coefficient to be biased in a negative direction. This partly explains the negative effect of wages on hours worked in many studies (for example, Rea 1974).

In some studies the normal weekly earnings are divided by hours worked in the survey week in order to determine the wage rate. Borjas and Heckman (1978, 328) point out that this biases the wage coefficient towards zero.

A number of studies attempt to avoid this problem by estimating the wage in a separate regression and using the predicted wage in the labour supply equation. This approach works only if there are some variables that affect wage rates but not labour supply. Given the data limitations, the best variable for predicting wage rates is education, which is positively related to labour supply. If education is excluded from the labour supply equation, the wage coefficient is biased in a positive direction.[4] This explains the positive wage coefficient in Kalachek and Raines (1970).

Borjas (1980) examines the effect of alternative specification of the wage and hours variables on the wage elasticities for mature men. The wage elasticity goes from negative to positive, depending on the specification. When wage rates for an earlier year are substituted for current wage rates, the wage elasticity becomes positive (.03). In a more recent work, Ham (1982) found an uncompensated elasticity of -.16 for men when the lagged wage rate was used.

Errors in Measurement of Non-wage Income. There is a general tendency for income to be under-reported in surveys. The errors seem to be particularly great for non-wage income. For example, a comparison of the national income accounts' total net income from investment with the aggregate amounts reported in the 1972 Survey of Consumer Finances in Canada indicates that only 70 per cent of non-wage income was reported.[5] Wages

and salaries in the survey closely match the national accounts data. This pattern seems to be typical of household surveys (see Rea 1972, Appendix B). If the proportion of under-reporting of non-wage income is the same at all income levels (which is unlikely), the non-wage income coefficients will be biased upward in absolute value.

Sample Selection Problems. Because of the focus of policy interest on income maintenance programs, many cross-section studies were undertaken with a low-income sub-sample of the population. Cain and Watts (1973) illustrate that this leads to potential biases in both the income and wage effects. Subsequent research was not based on samples truncated by income.

Most of the cross-section studies during the early 1970s were based on a sample of workers. This seemingly reasonable practice turns out to cause potential biases in the income and substitution effects. Keeley (1981) illustrates how the estimation problem arises. Assume that hours of work are a decreasing linear function of non-wage income, AB in Figure 5. All workers with a given non-wage income will not work exactly the same number of hours but instead will be randomly distributed around the true labour supply function.[6] When regressions are run with a sample of workers only, those with zero hours of work are excluded. Consequently, the estimated relationship between labour supply and non-wage income is CD, indicating that the negative relationship is biased towards zero.

A bias will also occur in the estimation of the wage coefficient. In Figure 6 the true relationship is AB, but when non-workers are excluded from the sample the estimated relationship is CD. Consequently, the wage coefficient is underestimated.

How serious is the sample selection problem? Wales and Woodland (1978) present the results of a Monte Carlo study of various methods of estimation. Hours worked are assumed to be a linear function of the logarithm of wages, with a coefficient of +1, and random error terms are then generated. The ordinary least squares estimates based on a sample of workers vary between .34 and .82, reflecting a substantial under-estimation of the wage coefficient.[7] The importance of the Wales and Woodland results depends in part on whether or not the true relationship is the one specified. There is some evidence that the sample selection problem is more serious for married women than for men (see Ham 1982).

Another sample selection problem arises because the wage rate is not

Figure 5
Sample selection bias on the income coefficient

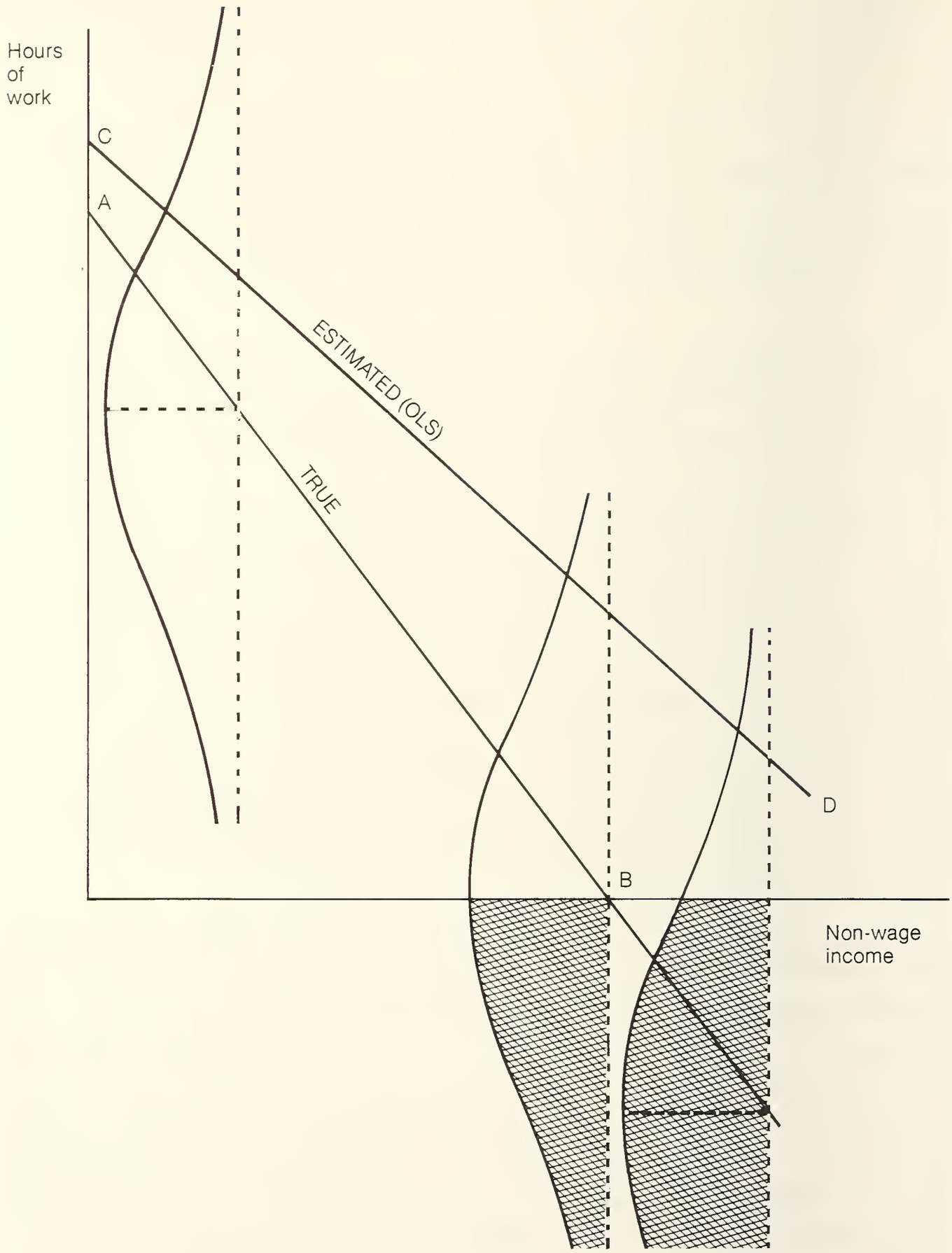
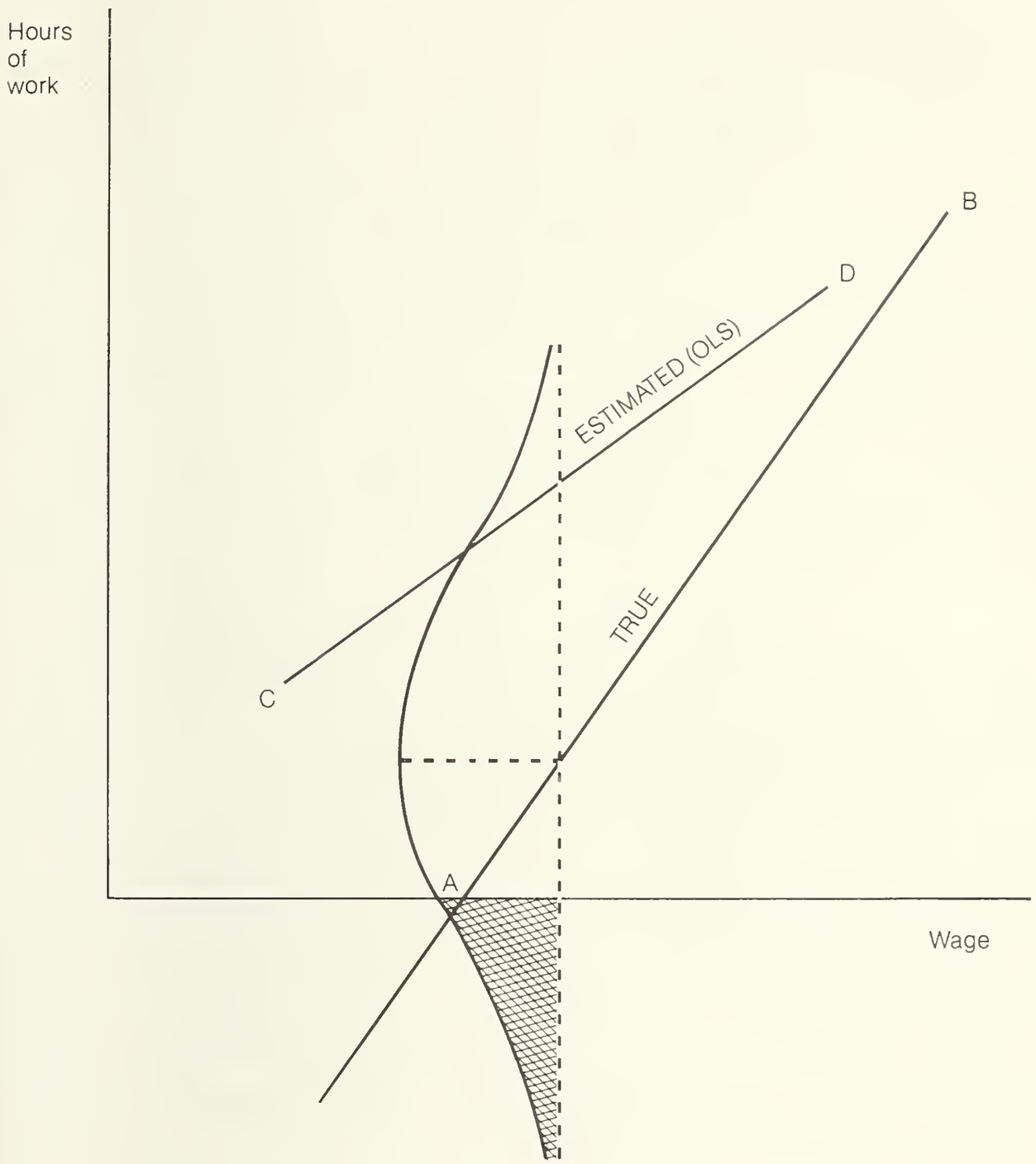


Figure 6
Sample selection bias on wage coefficient



observed for individuals in the sample who are not in the labour force. One method for estimating the impact of the wage rate on labour force participation is to estimate the wage rate for those in the labour force and use a predicted wage in the labour force participation equation. This approach leads to biased estimates because the model suggests that those in the labour force are likely to have higher wage rates for given measured characteristics than those not in the labour force (Gronau 1974).

Following Heckman (1974), econometric techniques have been developed that deal with the sample selection problem, particularly for women. Some of these techniques (the maximum likelihood estimates) incorporate the decision to participate and the hours-worked decision in one model and are designed to solve the wage rate measurement problem at the same time.[8] These econometric techniques tend to produce much larger wage elasticities than the ordinary least squares techniques that were used in earlier years. There are several reasons for this result. First, the ordinary least squares measures have a downward bias for the wage coefficient, as shown in Figure 6. Second, education, which has a positive effect on hours worked, is usually omitted from the hours equation when these techniques are used. Third, the labour supply function is usually assumed to be linear (or log-linear). If the model incorporates hours worked and participation changes, this specification essentially eliminates the possibility of a backward-bending supply curve. Using a less restrictive model, Nakamura and Nakamura (1981) found a backward-bending supply curve for women in the labour force in both Canada and the United States.

There is some confusion in the economics literature regarding the appropriate wage coefficient for predicting the response of labour supply to tax changes in models such as Heckman's. One might use either the change in hours of work for those who are working or the underlying parameters of the labour supply function (AB in Figure 6). The appropriate wage coefficient is the estimate of the slope of AB in Figure 6. If the predicted change in hours for an individual becomes negative, the hours must be set equal to zero. In studies in which the participation and hours decisions are estimated separately, the effect of a change in the net wage on labour supply is the sum of the hours change for those in the labour force and the change in participation. The participation change is likely to be important for married women.

Fixed Costs. Cogan (1980) introduces fixed costs into the Heckman model. He argues that the expenses that must be incurred when one enters the labour force or the time lost because of commuting alter the participation decision. These costs suggest that a higher wage rate will be required to induce someone to enter the labour force. For those already in the labour force the fixed costs increase the hours worked because of the income effect. Consequently, the true-hours-worked relationship has a flatter

slope than in Heckman's model without fixed costs (Figure 6). Cogan (1980, 357) finds that the Heckman model gives wage coefficients that are three times as large as those given by a model with fixed costs. An interesting implication of the introduction of fixed costs is that the ordinary least squares estimates of labour supply on a sample of workers are likely to give a wage coefficient that is more nearly correct than Heckman's model (Smith 1980, 21). This is illustrated in Figure 7.

Inclusion of Taxes. If taxes are ignored in the labour supply regressions, the wage and income coefficients will each be a combination of wage and income effects. The notion of the effective wage and the effective non-wage income suggests that the observed coefficients will equal the following (Cohen, Rea, and Lerman 1970):

$$\frac{\partial H}{\partial w} = \left[\left(\frac{\partial H}{\partial w_e}\right)_{\bar{u}} + H\left(\frac{\partial H}{\partial Y_e}\right)\right]\frac{\partial w_e}{\partial w} + \left(\frac{\partial H}{\partial Y_e}\right)\frac{\partial Y_e}{\partial w} \qquad (5)$$

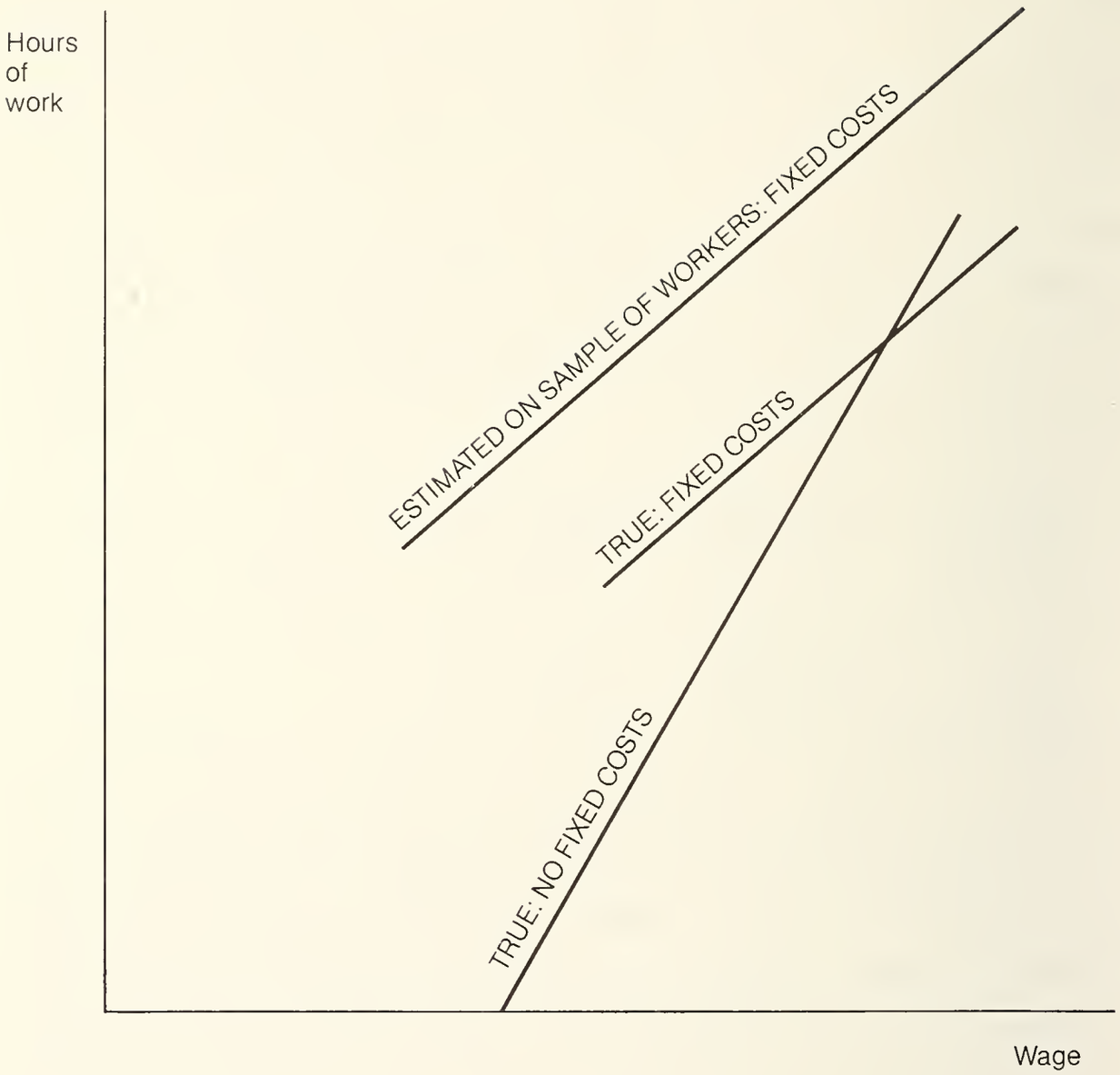
and

$$\frac{\partial H}{\partial Y} = \left[\left(\frac{\partial H}{\partial w_e}\right)_{\bar{u}} + H\left(\frac{\partial H}{\partial Y_e}\right)\right]\frac{\partial w_e}{\partial Y} + \left(\frac{\partial H}{\partial Y_e}\right)\frac{\partial Y_e}{\partial Y}\ , \qquad (6)$$

where subscript e indicates effective wage or non-wage income and the absence of e indicates that the symbol represents the observed gross wages and income. If one has estimates of $\partial H/\partial w$ and $\partial H/\partial Y$ and one knows the tax structure ($\partial Y_e/\partial Y$, $\partial w_e/\partial Y$, $\partial w_e/\partial w$, $\partial Y_e/\partial w$), equations (5) and (6) can be solved for the underlying coefficients. Using this technique, Cohen, Rea, and Lerman (1970, 59-60) found that the biases introduced by neglecting taxes were small when the wage and income coefficients were measured over a small range of income. However, most recent studies restrict the wage coefficients and income coefficients to be the same at all income levels, suggesting that the results are likely to be biased when taxes are omitted.

Since the theoretical model suggests that taxes affect the effective non-wage income and the effective wage rate, an obvious approach to the estimation of a model with taxes is to substitute effective non-wage income and the effective wage for the gross non-wage income and the gross wage. This approach (see, for example, Hall 1973) leads to estimation problems (simultaneity), since the effective wage and effective non-wage income are functions of labour supply. Rosen (1976) attempts to solve the problem by

Figure 7
Impact of fixed costs



evaluating the taxes at an arbitrary number of hours worked. This procedure may also lead to biased estimates.

Nakamura and Nakamura (1981) estimate a model of labour supply for married women in both Canada and the United States. They eliminate the simultaneity of the problem by an iterative procedure and are able to test whether labour supply depends on pre-tax or after-tax wages and income. Their estimates suggest that after-tax values are the relevant ones (Nakamura and Nakamura 1981, 475).

Wales and Woodland (1979) and Hausman (1981) develop techniques for dealing with the problem of estimating the labour supply model with taxes, but the assumptions required for estimation of their models cause one to

question the meaningfulness of the estimates (see Heckman and MaCurdy 1982b).

Estimates based on cross-section data

Tables 1 and 2 summarize the labour supply estimates from a number of cross-section studies. Most of the data in the tables is from Keeley (1981). The tables reflect the diversity of the estimates, which is due in part to the different methods of estimation. Table 1 indicates that there is some general agreement about the elasticities for men. Most of the studies seem to suggest that for men the wage coefficient is negative and the substitution effect is small. After a review of the evidence, Fullerton (1981) chose a figure of -.10 for the wage elasticity of men in his simulation of the impact of taxes. This figure is in accord with the estimates in Table 1. The marginal propensity to consume leisure, multiplied by -1, averages about -.20 in the studies reported in Table 1, giving a substitution elasticity of +.10.

The most notable exception among the studies reported in Table 1 is the Hausman study (1981), in which the wage and substitution elasticities were found to be +.03 and +.73 respectively. Hausman's estimates are sufficiently divergent from the other estimates that they cannot be accepted until his model is given additional scrutiny.

The wage elasticity estimates for married women, shown in Table 2, are more divergent. They range from negative to positive and are very elastic. There seems to be a general belief that a wage elasticity of 1.0 is reasonable for married women (Fullerton 1981), but the recent work of Nakamura and Nakamura (1981) casts some doubt on this conclusion. The estimates of Nakamura and Nakamura indicate that omission of taxes in a model of female labour supply tends to bias the wage coefficient in a positive direction. By including taxes and by estimating participation and hours separately, they reverse the sign of the wage coefficient for women. Nakamura, Nakamura, and Cullen (1979) point out that the overall wage response in this type of model, including increases in labour force participation, is positive.

Given the diversity of the estimates for married women, any conclusion drawn from them can only be tentative. Taking all of these estimates and their potential biases into account suggests a wage elasticity of +.50, a marginal propensity to consume leisure (multiplied by -1) of -.25,

TABLE 1
Labour supply estimates for men[a]

Author (source)	Data source[b]	Group	Gross wage elasticity $\frac{\bar{w}}{\bar{H}}\frac{\partial H}{\partial W}$	Substitution elasticity $\left[\frac{\bar{w}}{\bar{H}}\frac{\partial H}{\partial W}\right]_u$	Marginal propensity to consume leisure (multiplied by -1) $\frac{}{w}\frac{\partial H}{\partial Y}$
Boskin 1973, 177 (hours effects)	67 SEO	Whites prime age	-.29	.12	-.41
		Blacks prime age	-.20	0	-.20
Hall 1973 (Cain and Watts 1973, 333)	67 SEO	Whites	-.32	.06	-.38
		Blacks	-.30	-.10	-.20
Masters and Garfinkel 1977, 66 (hours employed)	67 SEO		.04	.08	-.04
Garfinkel 1973 (Cain and Watts 1973, 332)	67 SEO		0	0	0
Greenberg and Kosters 1973, 36	67 SEO	Basic male sample	-.14	.065	-.21
Hill 1973 (Cain and Watts 1973, 333)	67 SEO	Whites below poverty	-.21	.47	-.68
		Blacks below poverty	-.08	.27	-.35
Ashenfelter and Heckman 1974, 277	67 SEO		-.15	.12	-.27
Tella et al. 1971 (Cain and Watts 1973, 333)	67 SEO		.04	.17	-.13
Cohen et al. 1970 (Cain and Watts 1973, 332)	67 CPS		Negative	Negative	-.055
Fleisher et al. 1973 (Cain and Watts 1973, 332)	66-67 NLS		-.19	.04	-.23

TABLE 1 (continued)

Author (source)	Data source[b]	Group	Gross wage elasticity $\frac{\bar{w}}{\bar{H}}\frac{\partial H}{\partial W}$	Substitution elasticity $\left[\frac{\bar{w}}{\bar{H}}\frac{\partial H}{\partial W}\right]_u$	Marginal propensity to consume leisure (multiplied by -1) $-\frac{\partial H}{\partial Y}$
Kalachek and Raines 1970 (Cain and Watts 1973, 333)	66 CPS	Whites	.55	.86	-.32
Rosen and Welch 1971, 280	60 U.S. Census	Urban workers	-.27	.14	-.41
Masters and Garfinkel 1977, 66	PSID		0	.13	-.13
Cogan 1978, 50	67 NLS	Working wife	-.19	-.21	.024
		Nonworking wife	-.17	-.18	.012
Kniesner 1976, 6, 662	67 NLS	Working wife	-.17	-.16	-.0064
		Nonworking wife	-.06	Negative	Negative
Rea 1974	67 CPS	Married men, wife works	-.15	.04	-.20
Rea 1977	66-70 UIC		-.05	.35	-.40
Hausman 1981	PSID		.03	.73	-.70
Ham 1982	PSID		-.16	-.05	-.11
Robinson and Tomes 1982, 730	71 Canada Census		-.27	-.27	0

NOTES: a Most of this table comes from Keeley (1981, 98-99). b SEO = U.S. Survey of Economic Opportunity; CPS = U.S. Current Population Survey; NLS = U.S. National Longitudinal Survey; PSID = U.S. Panel Study of Income Dynamics; UIC = Canada Unemployment Insurance Commission tax data base.

TABLE 2
Labour supply estimates for married women[a]

Author (source)	Data source[b]	Group	Gross wage elasticity $\frac{\bar{w}}{\bar{H}}\frac{\partial H}{\partial W}$	Substitution elasticity $\left[\frac{\bar{w}}{\bar{H}}\frac{\partial H}{\partial W}\right]_u$	Marginal propensity to consume leisure (multiplied by -1) $-\frac{}{w}\frac{\partial H}{\partial Y}$
Boskin 1973, 177	67 SEO	Whites prime age	.19	.29	-.10
(hours effects)		Blacks prime age	.70	.77	-.07
Hall 1973 (Cain and Watts	67 SEO	White	4.60	2.50	2.10
1973, 336)		Black	1.66	.26	1.40
Cogan 1977, 42	67 NLS		.88	.92	-.04
Rosen 1976, 503	67 NLS		2.20	Negative	Positive
Masters and Garfinkel					
1977, 136	67 SEO		.43	.49	-.06
Masters and Garfinkel					
1977, 136	PSID		.43	.51	-.08
Heckman 1974 (Cogan					
1977, 46)	67 NLS		2.45	2.64	-.19
Cogan 1978, 55	67 NLS		2.84	2.86	-.02
Kalachek and Raines 1970		White females	.22	.80	-.58
(Cain and Watts 1973, 336)	66 CPS	Black females	.37	.21	-.58
Tella et al. 1971 (Cain	67 SEO	Wives with wage			
and Watts 1973, 337)		< $3	.07	.30	-.23
Rea 1974	67 CPS		-.02	.06	-.08
Rea 1977	66-70 UIC		-.05	.03	-.08
Nakamura & Nakamura	70 U.S. Census		-.10	.07	-.17
1981, 478-79[c]	71 Canada Census		-.15	.10	-.25
Hausman 1981	PSID		.91	1.42	-.51

NOTES: a Most of this table comes from Keeley (1981, 102); b See Table 1; c Average of coefficients for different age groups.

and a substitution elasticity of .75. The 'best-guess' estimates for both married women and men are shown in Table 3. A more general conclusion that would be accepted by most researchers is that the substitution elasticity is significantly larger for married women than for men.

Panel data

Panel data is the data obtained from a cross-section study that has been repeated, using the same individuals, for many years. Panel data from the University of Michigan Panel Study of Income Dynamics has allowed Heckman and MaCurdy (1980) and MaCurdy (1981) to estimate life-cycle models of labour supply.

The life-cycle model suggests that one must specify whether wage changes occur in one period or in every period of a worker's life and whether the changes are anticipated or unanticipated. Changes in the wage in one period relative to the wage in another period will tend to produce a larger response in that period than a change in the lifetime wage. Heckman and MaCurdy (1982a) estimate that the intertemporal wage elasticity for married women equals 2.2. Their estimate is very sensitive to changes in the specification of the model. For purposes of predicting the long-run impact of taxes, one would like to know the impact of a permanent anticipated change in wages and income. MaCurdy (1981) found that the permanent wage elasticity of lifetime labour supply equals +.05 to +.13 for men. The permanent income effect was negative but very small and statistically insignificant.

Carliner, Robinson, and Tomes (1980) and Robinson and Tomes (1982) estimate labour supply functions using 1971 Canadian Census data on participation over the respondent's lifetime. Both papers emphasize the simultaneous nature of the labour supply decision and the decision to have children, but unfortunately this simultaneous model does not provide direct estimates of the wage coefficient for women. The income effects were not statistically significant for men or women.

Time-series evidence

The long-term trend in hours worked over a lifetime is definitely downward. Table 4 indicates that standard weekly hours have declined decade by decade since the beginning of the century, but that in recent decades

TABLE 3
'Best-guess' estimates based on cross-section data

	Wage elasticity	Substitution elasticity	Marginal propensity to consume leisure (multiplied by -1)
Men	-.10	.10	-.20
Married women	.50	.75	-.25

the growth in leisure has increasingly taken the form of longer vacations and additional holidays. There is also a trend toward later entry into the labour force and earlier retirement.

There has been a tendency to interpret the long-run decline in hours as a reflection of changes in male labour supply. Female labour force participation has increased dramatically since the Second World War. Nakamura and Nakamura (1981) point out that in both Canada and the United States there is a downward trend in hours worked for women in the labour force. It is possible that this decline results from an increase in the number of marginal female labour force participants.

Interpretation of the time-series evidence is difficult because there have been changes in many variables. Owen (1971) concludes that a decrease in the price of market recreation accounts for 25 per cent of the increased demand for leisure in the United States. The increase in capital stock suggests that the average non-wage income is increasing over time. Increased female labour force participation and changing tax rates also cloud our interpretation of the data. However, one must conclude that the major explanation for decreased lifetime hours worked is the increase in real wage rates. Owen (1971) estimates that the wage elasticity is between -.11 and -.24, based on U.S. time-series data. The time-series evidence suggests that the backward-bending labour supply curve for men is likely to prevail.

Abbott and Ashenfelter (1976) combine the consumption decision with the labour supply decision and estimate a system of equations using U.S. time-series data from 1929 to 1967. Average taxes are taken into account. Wage elasticity ranges from -.07 to -.14, and the marginal propensity to consume leisure (multiplied by -1) ranges from -.13 to -.17 (corrected estimates from Abbott and Ashenfelter 1979, 568). These estimates imply compensated wage elasticities between .03 and .06.

TABLE 4
Hours worked in non-office manufacturing, Canada 1901-71

Year	Standard weekly hours	Hours net of vacations & holidays
1901	58.6	n.a.
1911	56.5	n.a.
1921	50.3	n.a.
1931	49.6	n.a.
1941	49.0	n.a.
1951	43.6	40.7
1961	41.5	38.1
1971	40.6	36.7

SOURCE: Gunderson (1980, 85).

Experimental evidence

Despite the widespread use of cross-section data for econometric estimation, there has always been concern that unobserved differences in individual characteristics might affect the coefficients. In the late 1960s, the United States government decided to fund an experimental program in New Jersey that would indicate the changes in labour supply that might arise from a negative income tax (NIT) program. Eventually, four such experiments were undertaken in the United States and one in Canada. The Canadian experiment was completed, but the Government of Canada did not provide funds for analysis of the data.

Because of problems inherent in experimental research, the experiments did not live up to their promise. One theoretical problem with such experiments is their temporary nature. If workers allocate their leisure over many years and can easily adjust their hours of work, the estimated income effects will be smaller and the substitution effects larger under a temporary NIT program than under a permanent one. Keeley (1981) reviews some statistical problems that were not appreciated when the experiments were designed. The use of income cut-offs to determine the experimental and control groups and the attrition of those in the sample created sample selection problems. The method by which the treatments (alternative tax rates, etc.) were assigned to families was based on an assignment model that may have biased the results. A more basic problem was that in most of the experiments the sample size was too small. It appears that the Seattle-Denver experiment was the only one large enough to provide estimates of income and substitution effects.

The experiments left little doubt that an income maintenance program has some effect, even if the exact amount is still uncertain. Furthermore, the experiments indicate that married women are much more likely to respond to NIT programs. Keeley (1981, 148-53) reports that the mean statistically significant effect for husbands was an 8 per cent reduction in work, while wives reduced their work by an average of 28 per cent.[9] These estimates are averages over many types of programs, and they are not adjusted for the size of the pre-experiment income relative to the value of benefits. However, they support the view that workers respond to changes in net wages and no-wage income.

Estimates of the underlying income and substitution effects for the Seattle-Denver experiment were remarkably close to the cross-section estimates for men. Keeley (1981, 159) averages the estimates from various studies and finds a wage elasticity of -.08, a substitution elasticity of +.12, and a marginal propensity to consume leisure (multiplied by -1) of -.21. There is not much variation in these estimates, but few of them are statistically significant.

The results for wives are generally different from the cross-section estimates. Keeley (1981, 163) calculates that the average wage elasticity is -.01, the substitution elasticity is .24, and the negative of the marginal propensity to consume leisure is -.25. There is a great deal of variation in the estimated wage elasticities, from -.91 to +.53, but the results are much more in line with the Nakamura and Nakamura (1981) estimates (for those in the labour force) than they are with other recent cross-section studies. Keeley (1981, 173) suggests that the experimental results may have picked up the cross-substitution effect caused by the simultaneous change in the husband's after-tax wage. Keeley (1981, 163) cites an unpublished study by Johnson and Pencavel that controls for the cross-wage effect and finds that the wage elasticity is .07.

Conclusions

Obviously the evidence on labour supply is far from conclusive, but on balance the evidence suggests that the elasticities shown in Table 3 are the best guesses. The wage and substitution elasticities for women are the most uncertain of the estimates, but it is clear that the substitution elasticity for women is much larger than it is for men.

IMPLICATIONS FOR POLICY

There are several reasons for concern over the labour supply effects of taxes and transfers. First, the taxes and transfers may reduce the annual hours of work. Second, the tax rates may be so high that reductions in tax rates will actually increase tax revenues (the Laffer Curve). Third, the taxes impose deadweight losses on society. It may be possible to reduce these losses by lowering the tax rates for those groups with the largest deadweight losses and raising the rates for those with the smallest deadweight losses. These three areas of concern will be discussed in turn.

Effect of taxes on labour supply

The impact of taxes on labour supply would be indicated by the uncompensated response if the taxes were not used for redistribution or if they did not provide goods and services that taxpayers perceived as income. Table 5 illustrates the impact of eliminating taxes for men and women with $30,000 in earnings, using the elasticities in Table 3. Male labour supply would decrease by 1.9 per cent and married female labour supply would increase by 35 per cent. This dramatic difference indicates how important it is to know the size of the income and substitution effects, but it should be pointed out that a married woman with this wage and income level would probably have elasticities more like the man's.

The compensated effect of the tax system in this example also reflects the difference in the response between men and married women. Men increase their work by 6.1 per cent, and women increase their work by 45.8 per cent.

In the November 1981 federal budget, the maximum Ontario plus federal marginal tax rate for 1982 was reduced to 50 per cent. Table 6 indicates the predicted response to the change in tax rates for those with $85,000 in earnings. (The 1982 rates were applied to the 1981 brackets.) Men are predicted to increase their work by .5 per cent, and married women are predicted to increase their work by 10.8 per cent. The change in tax rates was accompanied by other tax reforms that may affect taxpayers at this income level. If these other reforms increase taxes so as to offset the reduction in the tax schedule, the compensated labour supply effect will be relevant. The compensated response increases labour supply

TABLE 5
Effect of removing Ontario and Canada taxes on hours of labour supply, 1981, $30,000 earnings [a,b]

	Men	Married women
Compensated change in hours of work	+6.1%	+45.8%
Uncompensated change in hours of work	-1.9%	+35.7%
Deadweight loss ($)	349	2,620
Deadweight loss, % of taxes	4.6%	34.8%

a Marginal tax rate 38 per cent, average tax rate 25 per cent. In order to make the comparison, the taxes for a single person were used. The elasticities are from Table 3.

b This group would have a 61 per cent increase in effective wage and a $3,900 decrease in effective non-wage income. The following example for men illustrates how the estimates are calculated:

$$\frac{\Delta H}{H} = \left[\frac{\Delta w_e}{w_e}\right](e_w) + \left[W_e \frac{\partial H}{\partial Y}\right] \frac{\Delta Y_e}{(1 - \text{marginal tax})(\text{gross income})}$$

$$\frac{\Delta H}{H} = (+.61)(-.10) + (-.20) \frac{(-3,900)}{(1-.38)\ 30,000}$$

$$\frac{\Delta H}{H} = -.019.$$

by 1.6 per cent for men and 12.2 per cent for married women.

A problem arising from the current tax system is the lack of harmony between the federal and provincial tax systems at lower income levels. In 1980 a taxpayer with taxable income of $1,820 would pay $91 in additional taxes if he or she earned $10 in additional earnings. In 1981 this effect was reduced somewhat, but the tax rates are still very high in this income range. These high tax rates are likely to cause a reduction in labour supply for those whose earnings fall in this region.

The Laffer Curve

Most people agree that a 100 per cent tax would eliminate all work that produced taxable income, reducing tax revenues to zero, yet tax revenues are clearly positive at lower tax rates. This implies that tax revenues must reach a maximum at some tax rate and decline when tax rates are increased further. This relationship between revenue and tax rates is now known as the Laffer Curve, although Fullerton (1981) points out that the idea can be traced back to Adam Smith in 1776 and Jules Dupuit in 1844.

TABLE 6
Effects of November 1981 changes in tax rates, 1981 brackets, $85,000 earnings[a]

	Men	Married women
Compensated change in hours	1.6%	12.2%
Uncompensated change in hours	.5%	10.8%

NOTES: a The taxes fall from $35,171 to $33,159, the average tax rates fall from 41 per cent to 39 per cent, and the marginal rate falls from .57 to .50. This translates to a decrease in effective non-wage income of $3,885 (from $13,226 to $9,341), and an increase in the effective wage of 16.3 per cent (from .43w to .5w). The uncompensated change for men is

$$\frac{\Delta H}{H} = (.163)(-.10) + (-.20) \quad \frac{(-3,885)}{(1-.57)(85,000)}$$

$$\frac{\Delta H}{H} = .005$$

Are taxes now high enough that tax revenues would be increased by reducing tax rates? If we assume that the demand for labour is perfectly elastic, Fullerton (1981) shows that the Laffer Curve reaches a maximum where $t = 1 \div (1 + e_e)$. If the labour supply elasticity were 1, tax rates beyond 50 per cent would reduce tax revenues. If the elasticity of demand for labour is taken into account, the maximum revenue would occur at a higher tax rate.

Given the evidence that has been presented, it is clear that for men there is little possibility of increasing tax revenue by lowering tax rates. Married women may have sufficiently high elasticities, but the tax impact may be greatest at low income levels rather than at high income levels. The earnings of a married women who earned more than $505 ($490 net income) in 1981 were taxed at her husband's marginal rate until the marriage exemption was exhausted ($3,408 in earnings or $3,270 in net income). Those women who supply a small number of hours may have labour supply elasticities high enough, given the tax rates, that a decrease in tax rates would increase revenue.

Deadweight losses

The deadweight losses associated with taxes may seem ethereal, but they are just as real as the administrative cost of raising tax revenues. When

a taxpayer gives up a dollar's worth of utility, the government can purchase less than a dollar's worth of goods and services. Table 5 shows the deadweight losses for a man and a married women earning $30,000 in 1981. For the man the deadweight loss is only 4.6 per cent of tax revenues, while for the woman it is 34.8 per cent of tax revenues. These differences arise because the loss depends on the size of the substitution effect.

If one views the tax system as reflecting trade-offs between equity and efficiency, information that one group has significantly higher substitution effects should alter the trade-off in favour of lower taxes for those groups with the larger substitution effects and higher taxes for those with the smaller substitution effects (Rosen, 1977). This would imply a policy of lower tax rates for secondary workers in the family and higher tax rates for primary workers. The problem of high tax rates on secondary workers is not nearly as severe in Canada as it is in the United States, where joint filing effectively imposes higher tax rates on secondary workers. In Canada, this effect occurs only for those earning less than $3,408 (in 1981).

NOTES

1 The wage elasticity is the percentage change in work divided by the percentage change in the wage.

2 Three per cent of $505 could be deducted for employment expenses, giving 490 in net income that could be received before the spouse's taxes are increased.

3 For a detailed discussion see Heckman et al. (1981), Keeley (1981), and Borjas and Heckman (1978).

4 See DaVanzo et al. (1976). This point was made in Rea (1972).

5 This information comes from the data tape documentation.

6 The exact source of the error is usually ignored, but in more recent work such as Hausman (1981) tastes are assumed to be randomly distributed and are incorporated into the model.

7 The estimates depend on the correlation between the error in the wage equation and the error in the hours equation.

8 The missing wage rate problem and the correlation between the errors in the wage rate and the errors in the hours equation are dealt with by these techniques.

9 This excludes the increase in work found in the Gary experiment.

REFERENCES

Abbott, Michael, and Orley Ashenfelter (1976) 'Labour supply, commodity demand, and the allocation of time.' The Review of Economic Studies

43, 389-411

- (1979) 'Labour supply, commodity demand, and the allocation of time.' The Review of Economic Studies 46, 567-68

Ashenfelter, Orley, and James Heckman (1974) 'The estimation of income and substitution effects in a model of family labor supply.' Econometrica 42, 73-85

Borjas, George J. (1980) 'The relationship between wages and weekly hours of work: the role of division bias.' Journal of Human Resources 15, 409-23

Borjas, George, and James J. Heckman (1978) 'Labor supply estimates for public policy evaluation.' Proceedings of the Thirty-first Annual Meeting of the Industrial Relations Research Association, 320-31

Boskin, Michael J. (1973) 'The economics of labor supply.' In Glen C. Cain and Harold Watts, eds., Income Maintenance and Labor Supply: Econometric Studies (Chicago: Markham)

Burtless, Gary, and Jerry A. Hausman (1978), 'The effect of taxation on labor supply: evaluating the Gary negative income tax experiment.' Journal of Political Economy 86, 1103-30

Cain, Glen C., and Harold Watts, eds. (1973) Income Maintenance and Labor Supply: Econometric Studies (Chicago: Markham)

Carliner, Geoffrey, Christopher Robinson, and Nigel Tomes (1980) 'Female labour supply and fertility in Canada.' Canadian Journal of Economics 13, 46-64

Cogan, John F. (1977) 'Labor supply with time and money costs of entry.' R-2044-HEW (Santa Monica, California: The Rand Corporation)

- (1978) 'Conditional labor supply functions.' R-2045-DOL (Santa Monica, California: The Rand Corporation)

- (1980) 'Labor supply with costs of labor market entry.' In James P. Smith, ed. Female Labor Supply (Princeton: Princeton University Press)

Cohen, Malcolm, Samuel A. Rea, Jr., and Robert Lerman (1970) A Micro-Model of Labor Supply, Staff Paper 4 (Washington, D.C.: Bureau of Labor Statistics)

DaVanzo, Julie, Dennis N. DeTray, and David H. Greenberg (1976) 'The sensitivity of male labor supply estimates to choice of assumptions.' The Review of Economics and Statistics 58, 313-25

Fleischer, Belton M., Donald O. Parsons, and Richard D. Porter (1973) 'Asset adjustments and labor supply of older workers.' in Cain and

Watts (q.v.)

Fullerton, Don (1981) 'On the possibility of an inverse relationship between tax rates and government revenues.' Unpublished, Princeton University

Garfinkel, Irwin (1973) 'On estimating the labor supply effects of a negative income tax.' In Cain and Watts (q.v.)

Greenberg, David H., and Marvin Kosters (1973) 'Income guarantees and the working poor: the effect of income maintenance programs on the hours of work of male family heads.' In Cain and Watts (q.v.)

Gronau, Reuben (1974) 'Wage comparisons - a selectivity bias.' Journal of Political Economy 82, 119-44

Gunderson, Morley (1980) Labour Market Economics (Toronto: McGraw-Hill Ryerson)

Hall, Robert (1973) 'Wages, income and hours of work in the U.S. labor force.' In Cain and Watts (q.v.)

Ham, John C. (1982) 'Estimation of a labour supply model with censoring due to unemployment and underemployment.' Review of Economic Studies 49, 335-54

Hausman, Jerry A. (1981) 'Labor supply.' In How Taxes Affect Economic Behavior (Washington, D.C.: Brookings Institution)

Heckman, James J. (1974) 'Shadow prices, market prices and labour supply.' Econometrica 42, 679-94

Heckman, James J., Mark R. Killingsworth, and Thomas MaCurdy (1981) 'Empirical evidence on static labour supply models: a survey of recent developments.' In Zmira Hornstein, ed., The Economics of the Labour Market (London: Her Majesty's Stationery Office)

Heckman, James J., and Thomas E. MaCurdy (1980) 'A life cycle model of female labour supply.' Review of Economic Studies 47, 47-74

- (1982a) 'Corrigendum on a life cycle model of female labour supply.' Review of Economic Studies 49, 659-60

- (1982b) 'New methods for estimating labor supply functions: a survey.' National Bureau of Economic Research, Working Paper 858

Hicks, J.R. (1946) Value and Capital (Oxford: Clarendon Press)

Hill, C. Russell (1973) 'The determinants of labor supply for the working poor.' In Cain and Watts (q.v.)

Kalachek, Edward D., and Frederic Q. Raines (1970) 'Labor supply of lower income workers and the negative income tax.' In Technical Studies: the President's Commission on Income Maintenance Programs

(Washington, D.C.: U.S. Government Printing Office)

Keeley, Michael C. (1981) Labor Supply and Public Policy (New York: Academic Press)

Kniesner, Thomas J. (1976) 'An indirect test of complementarity in a family labor supply model.' Econometrica 44, 651-69

MaCurdy, Thomas E. (1981) 'An empirical model of labor supply in a life cycle setting.' Journal of Political Economy 89, 1059-85

Masters, Stanley, and Irwin Garfinkel (1977) Estimating the Labor Supply Effects of Income Maintenance Alternatives (New York: Academic Press)

Nakamura, Alice, and Masao Nakamura (1981) 'A comparison of the labor force behavior of married women in the United States and Canada, with special attention to the impact of taxes.' Econometrica 49, 451-89

Nakamura, Masao, Alice Nakamura, and Dallas Cullen (1979) 'Job opportunities, the offered wage, and the labor supply of married women.' American Economic Review 69, 787-805

Owen, John D. (1971) 'The demand for leisure.' Journal of Political Economy 79, 56-76

Rea, Samuel A., Jr. (1972) 'The supply of labor and the incentive effects of income maintenance programs.' Unpublished Ph.D. dissertation, Harvard University

- (1974) 'Incentive effects of alternative negative income tax plans.' Journal of Public Economics 3, 237-49

- (1977) 'Unemployment insurance and labor supply: a simulation of the 1971 unemployment insurance act.' Canadian Journal of Economics 10, 263-75

Robinson, Chris, and Nigel Tomes (1982) 'Family labour supply and fertility: a two-regime model.' Canadian Journal of Economics 15, 706-34

Rosen, Harvey S. (1976) 'Taxes in a labor supply model with joint wage-hours determination.' Econometrica 44, 485-507

- (1977) 'Is it time to abandon joint filing?' National Tax Journal 30, 423-28

Rosen, Sherwin, and Finis Welch (1971) 'Labor supply and income redistribution.' Review of Economics and Statistics 53, 278-82

Smith, James P., ed. (1980) Female Labour Supply (Princeton: Princeton University Press)

Tella, Alfred, Dorothy Tella, and Christopher Green (1971) 'The hours of work and family income response to negative income tax plans' (Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research)

Wales, T.J., and A.D. Woodland (1978) 'Sample selectivity and the estimation of labour supply functions.' University of British Columbia, Department of Economics, Discussion Paper No. 78-47

Wales, Terrence J., and A.D. Woodland (1979) 'Labour supply and progressive taxes.' The Review of Economic Studies 46, 83-95

Stabilization Policy Issues: An Appraisal of Possible Roles of Flexible Fiscal Policies in Ontario

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Stabilization policy can be viewed narrowly as the attempt to use policy instruments to iron out economic fluctuations or mitigate the business cycle. It can also be viewed more broadly as the attempt to improve economic performance with respect to the broad macroeconomic objectives of full employment, price stability, and adequate economic growth. In this discussion the broader view is taken, because conflicts between the simultaneous realization of each of these objectives would rule out the single target approach implied by the narrower view. Furthermore, recent concern about the supply-side effects of fiscal policies can only be encompassed within the broader multi-objective view of stabilization policy.

An analysis of fiscal policy for stabilization should consider the impact of any changes in fiscal instruments on these macroeconomic variables. Hence a set of budgetary measures designed to achieve some other objectives (such as income redistribution) could affect one or more of these broad macroeconomic objectives and also be logically viewed as part of fiscal policy for stabilization. Only a set of budgetary measures that was neutral in its impact on these three objectives should be viewed as having no stabilization effect. Indeed, the recent history of federal budgets provides numerous illustrations of complex tax changes that have had important macroeconomic consequences. One need only cite the major tax reform of 1972, the introduction of indexation in 1974, and the November 1981 federal budget proposals to provide appropriate illustrations. The recent introduction of indexed investment funds represents yet another tax structure measure, perhaps justifiable on grounds of equity and efficiency, that could nevertheless have important macroeconomic medium- and long-

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term consequences (see Canada 1982).

If there were only one macroeconomic objective (e.g., stabilization of real income), and there were at least one effective instrument which had minimal side-effects on other objectives, then stabilization could be partitioned from the resource allocation and distributional activities of governments. The stabilization authority could always neutralize the side-effects of other policies on the single macroeconomic objective through appropriate manipulation of the single effective instrument. These other policies would complicate the task of stabilization, but effective stabilization would not require additional policy instruments.

With multiple objectives of stabilization policy, the task of stabilization in general requires multiple instruments. The effectiveness with which multiple objectives may be attained will, in general, increase as the number of policy instruments increases. However, some prospective policy instruments may be dominated by one or more combinations of existing instruments, so that the addition of such a policy instrument would not improve the effectiveness of stabilization policy.

The task of this chapter is to appraise the possible role of the province in stabilization policy and to consider the impact of a separate provincial personal income tax (PIT) on the potential effectiveness of provincial stabilization policy.

THE ROLE OF THE PROVINCE IN STABILIZATION POLICY

It is generally agreed that the federal government has and should have primary responsibility for the conduct of stabilization policy. Monetary policy, one of the two 'big levers' of stabilization policy, is a federal responsibility under the constitution, effectively precluding the provinces from more than a consultative role in its execution. Because the Canadian economy is a broad common market for both products and factors of production,[1] the effects of fiscal actions taken by a province (or of federal policies directed towards a province) usually spill over into other provinces. These externalities can be reinforced, attenuated, or even reversed by policy design. A decentralization to the provinces of fiscal policy for stabilization would increase the risk of induced external effects and self-cancelling beggar-my-neighbour fiscal policies. Indeed, vigorous use of fiscal policy to attract factors of production - particularly capital - to particular provinces would fracture the framework of the common market

itself, with potentially serious economic and political repercussions.

Because the favourable external effects of provincial fiscal policies would be given little weight by provincial governments, provincial fiscal policies would likely either be too weak, or be designed to increase the impact of the policy within the province at the expense of other provinces. Hence primary responsibility for stabilization policy should be assigned to the federal government. However, this does not mean there is no role for the provinces to play. The involvement of the provinces in stabilization policy should lead to improved performance with respect to regional economic objectives. Canada has faced for some time a chronic problem of regional imbalance, coupled with greater cyclical fluctuations in some regions than in others. In many instances, expansionary fiscal policies could be more effective in countering recession if they were focussed on the more depressed regions. In other situations, restrictive fiscal policies would be more effective in reducing inflation (at lower cost in terms of employment and growth) if these policies could be focussed on the expanding regions. However, political tolerance of federal moves to accommodate regional disparities via a regionally discriminatory federal stabilization policy appears extremely limited, particularly in the case of restrictive fiscal policies. It follows that the use of provincial fiscal policies as an adjunct to federal policy - supporting federal policy in those provinces where the cyclical problem is more acute, and offsetting fiscal policies where the cyclical problem is less acute (or indeed opposite to that of the nation as a whole) - could improve the overall average performance of stabilization policy.

Before turning to an examination of new evidence of the effectiveness of provincial stabilization policies in Ontario, it is worth examining briefly the long-term outlook for the Ontario economy. Fortunately, a recent Ontario Economic Council study has examined the outlook over the decade of the 1980s. The following is a summary of the projections developed in that study.

GROWTH PROSPECTS FOR THE ONTARIO ECONOMY

A recent study prepared for the Ontario Economic Council (Dungan and Crocker 1982) presents projections to 1990 for the Canadian economy and for its major regions. In this section we briefly summarize some relevant information from their projections for the national and Ontario economies.

1 The middle and later years in the current decade should witness some recovery from the dismal performance of recent years, but the high growth rates of the sixties and early seventies are unlikely to be repeated.

2 The Ontario economy's growth continues to run somewhat behind the growth of the national economy, reflecting the resource-related strength of the western provinces.

3 Employment growth in Ontario is also projected to be somewhat below the national average, as migration to the western provinces continues. Productivity growth in the province is virtually identical to national productivity growth. However, aggregate productivity growth is projected to increase at a slow 0.7 per cent rate over the decade. While this represents a reversal of recent declines in productivity performance, it is considerably below the rate of growth of productivity achieved over the 1960-75 period. A major factor contributing to slower aggregate productivity growth is the shift of investment towards the capital-intensive primary energy sectors.

4 Aggregate price inflation in Canada is projected to drop below double-digit rates and to average 8.8 per cent over the decade. Aggregate price inflation in Ontario is projected at 8.3 per cent. While both figures represent an improvement over the recent past, they indicate that the inflationary problem may remain serious well into the decade.

5 Ontario's nominal income share drops more rapidly than its real output share, reflecting the projected continuation of adverse movements in the terms of trade for Ontario over the decade.

6 Although Ontario's relatively strong position in manufacturing diminishes somewhat over the decade, over one-half of the decade's manufacturing output is produced in Ontario. Ontario is dominant (87 per cent) in the manufacturing of motor vehicle parts, and produces two-thirds of the output of electrical products. Other areas of strength include primary metals (57 per cent), machinery and other transportation equipment (56 per cent), and chemicals (55 per cent). Ontario's share is below its per capita share for primary industries (agriculture and mining), construction, and utilities.

The relative concentration of manufacturing, and particularly durable goods manufacturing, within Ontario means that the Ontario economy will remain as vulnerable to the business cycle as in the past. Moreover, because cyclical fluctuations will occur around a slower growth trend, episodes of near-zero or negative growth may continue to be frequent occurrences. Political pressures on the Ontario government to adopt counter-cyclical policies could well be stronger in this environment of slower growth, albeit somewhat tempered by recognition of the inflationary consequences of mistimed or misdirected fiscal measures.

In a climate of slower growth, governments may choose to direct counter-recessionary policies toward contributing to improved efficiency and productivity growth rather than toward improving equity through income redistribution. This would mean a greater emphasis on stimulus to investment rather than to consumption, and less effort to target counter-cyclical relief towards lower income groups.

A more flexible PIT would obviously widen the range of choice open to the Ontario government in focussing counter-cyclical fiscal stimulus to have maximum impact on investment. Whether this range of choice could be accomplished without a separate Ontario PIT would depend on the degree of flexibility possible within the existing joint federal-provincial PIT system. For example, if the federal government were to accept separate provincial rate schedules and to permit implementation of savings and investment credits and other growth-oriented tax credits, this would provide the Ontario government with much of the freedom of choice to adopt growth-oriented policies it could attain by establishing a separate PIT.

Since the preparation of the OEC study noted above, national growth projections have again been revised downwards. This reflects the cancellation of certain western energy projects and the impact of a more serious recession on medium-term prospects for business fixed capital formation. The point emphasized above that stabilization policy will be operating in a climate of slower growth is therefore reinforced by these more recent projections.

The next section reviews current evidence on the effectiveness of Ontario fiscal policies, utilizing the FOCUS and PRISM economic models.

EFFECTIVENESS OF PROVINCIAL FISCAL POLICIES

In an earlier review of the potential effectiveness of fiscal policy in Ontario (Wilson 1977), I concluded that the evidence available at that time indicated that Ontario fiscal actions would have a smaller relative impact on the Ontario economy than equivalent federal actions on the national economy. Although major economic effects would occur within the province, Ontario fiscal actions would also generate significant effects in other provinces. Since the preparation of that study, the PRISM model has been developed by the Institute for Policy Analysis to augment its FOCUS national model.[2] The PRISM model develops regional and industrial projections on the basis of the FOCUS model's national projections of aggregate demand and its composition. With appropriate modifications, it is possible to use this combination of models to analyse the comparative effects of provincial and federal fiscal policies.

The details of the simulation analyses are presented in an appendix to this paper. The results may be briefly summarized. Four fiscal experiments were conducted under two alternative monetary and exchange-rate regimes. An increase in federal government spending on government fixed capital formation is compared with a similar increase in provincial spending on the same component of demand, with the initial spending concentrated within the province. A general federal income tax reduction is compared with a provincial income tax reduction involving the same initial absolute revenue loss, but with the initial consumer spending generated by the tax cut concentrated within the province.

The alternative monetary and exchange rate regimes include:

- a floating exchange rate with monetary policy geared to a narrowly defined money supply target, and
- a fixed exchange rate with monetary policy geared to maintain that exchange rate.

The results of the two national policy simulations are shown in Table 1. Note that the fiscal multipliers are stronger under a floating exchange rate than under a fixed exchange rate, indicating that the effects of fiscal actions on the current account of the balance of payments dominate capital account effects in the FOCUS model. The multipliers for expenditures are stronger than for taxes, a common result in macroeconomic models driven primarily by real aggregate demand.

The time patterns of response indicate that there is a more rapid

TABLE 1
National fiscal multipliers

	Year following fiscal change				
	1	2	3	4	5
A. Expenditure multipliers[a]					
Fixed exchange rate	.748	.700	.588	.534	.334
Floating exchange rate[b]	1.268	1.668	1.540	1.038	.745
B. Inverse tax multipliers[c]					
Fixed exchange rate	.243	.328	.349	.356	.257
Floating exchange rate	.504	.882	1.087	1.074	.980

a Real GNP increase per real dollar of government spending increase.
b M1 money supply growth exogenous.
c Real GNP increase per real dollar of personal increase tax reduction.

response to expenditure increases than to tax cuts, reflecting the lagged adjustment of consumer spending to changes in disposable income. Under a fixed exchange rate, the maximum impact on real GNP occurs in the first year of the expenditure increase, and in the second and third years following the tax cut. The fiscal effects then attenuate as crowding-out occurs through price level and interest rate effects. Under a floating exchange rate, the peak response is delayed until the second year following the expenditure increase and until the third year following the tax cut, reflecting the delayed indirect effects of induced exchange rate changes.

The national multipliers are quite low in the fixed exchange rate simulations, reflecting the negative impacts of the substantial induced monetary response required to maintain the value of the Canadian dollar (M1 drops by 1.8 per cent in the first year of the expenditure increase, and by 0.9 per cent in the first year of the tax cut). Under a fixed exchange rate, the maximum expenditure multiplier is 0.75 and the maximum inverse tax multiplier is 0.36. Without these induced monetary responses, the fiscal impacts are considerably stronger. In the floating exchange rate simulations, the maximum real expenditure multiplier is 1.67, and the corresponding inverse tax multiplier 1.08.

The PRISM model provides estimated provincial and industrial distribution effects of the national policies. The results, tabulated in Table 2, indicate that the relative impact of the national policies on Ontario is quite

TABLE 2
Relative effects of national fiscal policies on the national and Ontario economies

	Per cent impact on gross domestic and gross provincial product in year following fiscal change				
	1	2	3	4	5
A. Expenditure increase of 500 million 1971 dollars					
Fixed exchange rate					
national (%GDP)	.26	.24	.20	.19	.12
Ontario (%GPP)	.24	.21	.15	.14	.06
Floating exchange rate					
national (%GDP)	.47	.61	.52	.32	.22
Ontario (%GPP)	.46	.62	.52	.29	.18
B. Tax reduction of 500 million 1971 dollars					
Fixed exchange rate					
national (%GDP)	.09	.13	.15	.16	.14
Ontario (%GPP)	.10	.13	.15	.16	.14
Floating exchange rate					
national (%GDP)	.19	.34	.41	.39	.36
Ontario (%GPP)	.21	.36	.44	.42	.39

comparable to their national impacts. However, the reader must be cautioned that these results apply to federal expenditures and tax changes that have no particular regional focus. Such differences as occur are the result of different regional distributions of sectoral activity. For example, increased government capital expenditures (largely on structures) are assumed to be distributed as the average of all construction activity, which is somewhat lower than average (on a per capita basis) in Ontario. On the other hand, tax cuts have a relatively strong short-run impact on consumer durables, of which Ontario is the major producing province.

The final two pairs of simulations provide estimates of the impact of Ontario policies on the Ontario economy. For comparability with the national results, the relative magnitude of the expenditure and tax changes are the same as for the corresponding federal policy experiments. As a

result, the FOCUS model national results for the Ontario policy simulations are identical to those of the federal policies.

The impact of Ontario policies on Ontario would likely deviate from that of federal policies even if there were no specific regional bias to the provincial policies. Because many goods and services are either non-tradeable or have non-trivial transportation costs, both government spending and consumer spending will naturally be directed more towards Ontario products than in the case in the national policy simulations. Without a consistent model of the Ontario economy comparable to the FOCUS national model, the extent to which spending is shifted towards goods and services purchased in Ontario cannot be estimated with the same precision as the national effects. However, it is possible to adjust PRISM to derive rough estimates of these shifts; a discussion of the details of these adjustments is provided in the appendix. Summary results of the simulations are presented in Table 3 below. As is readily apparent, the estimated impact of provincial expenditure increases on provincial output is considerably stronger than the comparable federal government spending impact. Under a fixed exchange rate, the initial impact is more than double the national impact. Moreover, the impact does not attentuate significantly over time, indicating that the crowding-out effects are shared extensively with other provinces. Under a floating exchange rate, about the same absolute changes in the relative impacts occur (the relative impacts being roughly 0.4 higher in both simulations). More illustrative are the estimated multipliers shown in Table 4, which compares the national multipliers for national policies with the corresponding Ontario multipliers for Ontario policies. As is clear, the short-run Ontario expenditure multipliers are somewhat smaller than their national counterparts. In the case of government spending, the provincial multipliers are about two-thirds the national ones under a floating exchange rate over the first three years, but the multipliers converge by the fifth year.

Under a fixed exchange rate, the Ontario expenditure multiplier is about 85 per cent of its federal counterpart in the first year, but a convergence occurs by the third year, and by the fifth year the Ontario multiplier is 50 per cent higher than its national counterpart. This result, which may appear counter-intuitive, reflects the fact that provincial government capital expenditures have very little import leakage (international or interregional) from the area in which they take place, while their mone-

TABLE 3
Ontario fiscal multipliers

	Year following fiscal change				
	1	2	3	4	5
A. Expenditure multipliers[a]					
Fixed exchange rate	.63	.62	.61	.59	.51
Floating exchange rate	.82	1.03	1.02	.86	.76
B. Inverse tax multipliers[b]					
Fixed exchange rate	.20	.25	.28	.28	.23
Floating exchange rate	.30	.49	.60	.62	.58

a Real GPP increase per real dollar of provincial government spending increase.
b Real GPP increase per real dollar of provincial personal income tax reduction.

TABLE 4
Comparison of national and Ontario fiscal multipliers

	Year following fiscal change				
	1	2	3	4	5
A. Expenditure multipliers[a]					
Fixed exchange rate					
national	.75	.70	.59	.53	.33
Ontario	.63	.62	.61	.59	.51
Floating exchange rate					
national	1.27	1.67	1.54	1.04	.75
Ontario	.82	1.03	1.02	.86	.76
B. Inverse tax multipliers[a]					
Fixed exchange rate					
national	.24	.33	.35	.36	.26
Ontario	.20	.25	.28	.28	.23
Floating exchange rate					
national	.50	.88	1.09	1.07	.98
Ontario	.30	.49	.60	.62	.58

a As in Table 3.

tary and price level crowding-out effects are spread across the country as a whole. Furthermore, the extra activity generated within the province leads to some increase in net migration into the province, which generates somewhat higher shares of services and other tertiary activities within the province. Taken together, these effects explain why the Ontario multiplier is higher than the national multiplier over the medium term.[3]

Because of greater leakages of consumer demand to other provinces and to imports, the provincial tax multipliers are relatively smaller than the expenditure multipliers. Under a fixed exchange rate, the maximum inverse tax multiplier, reached in the third and fourth years following the tax cut, is only 0.28. Under a floating exchange rate, the inverse tax multiplier builds up to 0.62 in the fourth year, which is 42 per cent below its federal counterpart.

These results suggest that fiscal policy for stabilization is feasible for the Province of Ontario. While the income multipliers for fiscal actions are typically somewhat smaller than their national counterparts, the multipliers are not so low as to render provincial policy ineffective, at least under a floating exchange rate system.[4] The simulations also indicate that the multiplier effects of government capital expenditure changes are considerably larger than the corresponding effects of equivalent general income tax changes. Of course, these broad aggregate results tell us little about possible supply-side effects of policies. But if one's principal concern is impact on real aggregate demand, expenditure changes appear to have the edge over income tax changes. Of course, this conclusion is weakened if expenditure changes are subject to a greater 'inside lag'[5] than tax changes, because the probability of destabilizing fiscal actions is thereby increased.

However, the low Ontario multiplier for general personal income tax changes would indicate that, from the standpoint of stimulating aggregate demand within the province, such general tax increases are likely to be less effective than more selective measures, such as sales tax changes focussed on Ontario products, or timely expenditure changes. With a separate personal income tax, of course, it would also be possible to introduce selective income tax measures designed to strengthen demand effects within the province and to reduce leakages to imports and to other provinces.

A SEPARATE PERSONAL INCOME TAX AND STABILIZATION POLICY

The Province of Ontario already has at hand, and has used, a large number of fiscal instruments to pursue stabilization objectives. Expenditure programs have been altered for stabilization purposes, a variety of temporary sales tax changes have been introduced, and the corporate income tax structure has been altered. Recently, the province also increased its personal income tax rate for the first time. In the past, it also followed the lead of the federal government when the so-called temporary federal tax reduction was introduced.

While the existing array of instruments is doubtlessly adequate for the purpose of stimulating or reducing aggregate real demand in the province, there are a number of problems with the existing joint PIT system.

First, it is difficult if not impossible to treat corporate and unincorporated enterprises neutrally. As a result, provincial tax initiatives designed to stimulate business investment are applicable only to the corporate sector. Two examples are provided in the 1982 provincial budget:

1 The province has refused to follow the federal lead in limiting first year capital cost allowance deductions. However, without a separate PIT this can only be applicable at the corporate level. Unincorporated enterprises and individuals with property income therefore cannot avail themselves of this benefit.

2 To provide some relief from the recent recession, a two-year tax holiday was declared for small incorporated enterprises. This amounts to an effective tax reduction of 10 percentage points for those enterprises. A similar tax reduction for unincorporated enterprises is of course not feasible under the existing joint PIT system.

With either a separate PIT or a more flexible joint system, this type of non-neutral treatment of corporate and unincorporated enterprises could be avoided.

Second, the existing joint PIT system makes it difficult to change the general tax level without altering the degree of progression of provincial income taxes. With provincial taxes calculated as a percentage of federal tax, an increase in the provincial tax rate automatically increases progressivity, and a decrease automatically reduces it. This is not as im-

portant an issue as the issue of neutrality discussed above, because the use of tax credits and surtaxes permits some additional flexibility (and examples of both now exist in several provinces). However, the problem could be eliminated entirely under either a separate PIT or a joint federal-Ontario PIT with a separate provincial tax rate schedule.

Third, the existing joint system forces the province automatically to adopt federal tax measures that may be undesirable from the standpoint of the province. For example, as a leading producer of capital equipment, Ontario may favour an investment stimulus over government spending as a means of combating recession. If the federal government adopts the opposite policy, as illustrated in the November 1981 federal budget, the federal PIT measures that adversely affect investment automatically apply to the provincial component of the joint PIT, thereby reinforcing the very effects of federal measures that are undesirable from the province's standpoint. A separate PIT would eliminate this problem, and a more flexible joint system could lessen it.

Fourth, the existing joint federal-provincial PIT complicates the introduction of certain provincial fiscal changes designed to affect aggregate supply. For example, investment tax credits could be established for corporate but not unincorporated enterprises, and measures to increase personal savings, such as indexing of RRSP limits or establishing shareholder investment plans, cannot be introduced by the province acting alone. A separate PIT would obviously provide complete flexibility to use provincial taxes for such purposes; a more flexible joint PIT could alleviate many of the difficulties.

LIMITATIONS ON POLICY DESIGN FLEXIBILITY UNDER THE EXISTING JOINT PIT SYSTEM

As noted in the introduction, the stabilization objectives include full employment, price stability, and adequate economic growth. Many fiscal instruments may lead to improvements for one of these objectives, but at the cost of worsened performance with respect to another. For example, an increase in government spending will tend to increase output and reduce employment in the short run, but at the cost of increased price inflation over the longer term (the modern version of the Phillips curve trade-off).

The trade-off dilemma posed by the use of policy instruments that

affect aggregate demand alone has led policymakers to respond with considerable interest to proponents of so-called supply-side measures. If policies shift aggregate supply as well as aggregate demand, it should be possible to improve real output without increasing the rate of inflation in the long run.

It is analytically useful to separate supply-side effects into one-shot measures, which have a once-and-for-all effect on the aggregate price/output relationship, and measures designed to provide a more sustained increase in aggregate supply. Both types of measures may be useful in the design of policies to improve performance with respect to output, employment, and prices.

Two examples will illustrate these two types of supply-side measures.

A permanent reduction in retail sales taxes is an example of a policy with a one-shot supply-side effect. Since these taxes are a component of unit cost, their reduction has a negative cost-push effect on the price level (analogous to the effects of a once-and-for-all reduction in oil prices). These taxes at the same time would stimulate aggregate demand, so that output would increase and demand pressures on prices would also increase. The net effect of the sales tax reduction on the price level depends on such factors as the level of capacity utilization and unemployment at the time of the tax cut, and the length of time that elapses following the tax cut. Under most circumstances, the initial impact of a sales tax cut is to reduce the price level, but as time passes the reduction is attenuated and is eventually reversed by the demand effects (assuming no change in other policies). Typically, econometric model simulations would indicate that for a considerable period of time following a sales tax cut the price level would remain lower than it otherwise would have been. If the sales tax cut is accompanied by other policies designed to neutralize its aggregate demand effects (such as an increase in personal income taxes or a reduction in government expenditures), a permanent reduction in the price level can be achieved. Indeed, under certain circumstances, with appropriate companion monetary and fiscal policies, a permanent reduction in the rate of inflation can be achieved with little or no cost in terms of forgone output and employment.

The changes in the corporate and personal income tax structures designed to increase investment are an example of a set of measures with more lasting supply-side effects. Increased capital formation increases the growth of potential output or aggregate supply. Although the effects on

the growth of potential output are typically modest, they also typically persist for a long period of time. Improvements in labour productivity growth that accompany the increase in capital formation help to mitigate the wage-price spiral, permitting some expansion of realized output and employment without additional inflationary pressures.

Ontario's ability to adopt appropriate supply oriented policies without adverse effects on other objectives is somewhat limited under the existing integrated joint PIT system for some stablization strategies. For example, sales tax reductions coupled with income tax increases with approximately the same incidence across income groups could contribute to reduced inflation in the short term, with little or no effect on vertical equity. Because a provincial income tax increase falls most heavily on middle- and upper-income groups, whereas a sales tax reduction is of a higher relative benefit to lower-income groups, an appropriate adjustment in the refundable Ontario sales tax credit could accompany the changes in sales and income tax rates. In this case, therefore, no modification in the existing system would be required. However, this does not permit the 'fine tuning' that could readily be accomplished with a separate provincial rate schedule.

In a counter-example, Ontario's leverage to stimulate investment is limited under the current system. Stimulative measures can be introduced at the corporate level, but their impact cannot be reinforced by appropriate personal income tax changes. Moreover, too great a discrepancy in tax rates applicable to corporate source income and to individual income derived from unincorporated business could have adverse effects on sectors such as agriculture and rental housing.

It is clear that increased flexibility in policy design would permit some improvement in the effectiveness of provincial fiscal policies in dealing with multiple objectives of stabilization policy. How important this improvement is cannot be readily determined, because it depends on both the state of the national and provincial economies, and the impact of federal actions on the Ontario economy. For example, if there were little problem of conflict between the objectives, and if the performance of the Ontario economy closely paralleled that of the rest of the country, there would be little advantage to increased flexibility of policies at the provincial level, provided that federal policies were appropriate. In this situation, the piggybacking of Ontario tax changes on federal tax changes could well be sufficient for stabilization purposes.

An opposite example would be a situation in which the Ontario economy's growth prospects were much weaker than the rest of Canada's, with investment strong in the West and/or East and weak in Ontario. Under these circumstances, a regionally neutral fiscal policy might not be optimal. If political concerns or constitutional constraints limit the adoption of regional discriminatory federal policies, a flexible Ontario fiscal policy would permit the province to provide appropriate stimulus to capital investment (assuming that the growth objective is of principle concern to Ontario policymakers).

Viewed solely from the standpoint of stabilization policy, the principal cost of a separate PIT for Ontario would be through a reduction in the effectiveness of federal stabilization policy. The next section addresses this issue.

EFFECTS OF A SEPARATE PIT ON FEDERAL FISCAL POLICIES

The existence of separate PITs in major provinces would have no effect on some federal fiscal instruments, but it would reduce the leverage of others.[6] Assuming no provincial response to a federal initiative, the existence of separate provincial PITs would have no effect on the following instruments:

1 federal expenditure programs,
2 federal transfers to individuals,
3 federal sales and excise taxes,
4 federal corporate income taxes, and
5 federal surtaxes and credits under the federal PIT.

Separate provincial PITs would reduce the leverage of any federal tax change that affected 'basic federal tax', such as changes in deductions, definition of income, index capping, averaging, and dividend integration.

One could argue that the existing joint PIT system may bias the federal government's choice towards instruments that apply leverage at the provincial level. In a recession, for example, a levered tax cut achieves the same real effect with two-thirds of the impact on the federal deficit of an unlevered tax cut. In combating inflation, the political costs of increasing taxes may be shared with provincial governments through levered tax increases. However, one could also argue the converse of the last

point. Given the political visibility of the federal deficit, and the lack of visibility of provincial income taxes to many taxpayers under the existing joint PIT system, an unlevered tax increase might be favoured because of its larger impact on the federal deficit. Whatever way the bias runs will depend on the federal cabinet's appraisal of public concern about the federal deficit on the one hand and about the level of taxes on the other.

It can be argued that the leverage issue is far better removed completely, which either a separate provincial PIT or a more flexible joint PIT system would accomplish. Alternatively, there could be an understanding that the federal government should not introduce structural changes that affect 'basic federal tax' without full consultation with the provinces. Federal income tax credits and surtaxes provide a great deal of flexibility for the federal government to implement stabilization policies without affecting basic federal tax. Such an agreement would preclude the federal government from tinkering with such features of the tax system as indexing, the capital cost allowance system, and averaging, without provincial consultation (and ideally without full public consultation).

POSSIBLE PERVERSE FISCAL BEHAVIOUR AND A SEPARATE PIT

Would a separate PIT increase the probability of perverse fiscal behaviour by the province? First, we note that there is little evidence of perverse fiscal behaviour by either the provincial/municipal sector as a whole, or by Ontario in particular. Indeed, the fact that Ontario has initiated discretionary contra-cyclical actions is strong prima facie evidence against the perversity hypothesis. The behaviour of the major provinces or of the provincial sector as a whole in Canada does not appear to be cyclically perverse.

The perversity hypothesis is most appropriate for a federation composed of very small units with inadequate federal stabilization programs. In such a situation, the need of the small units to maintain their creditworthiness through conventional budget-balancing behaviour is the principle cause for concern about perverse discretionary policies. The subsidiary government units, not having direct access to the central bank, may raise tax rates or cut expenditures when recession lowers revenues. The collective result is a perverse tightening of fiscal policies, thereby worsening the recession.

In Canada, the dominance of large provinces within the provincial

sector (Ontario and Quebec alone account for 62 per cent of gross domestic product, Alberta and B.C. for an additional 24 per cent) and the existence of federal equalization and revenue guarantee schemes has undermined the sources of possible perverse fiscal behaviour. While the stabilization schemes could doubtlessly be improved (see Canada 1966), on balance the provinces have not behaved in a cyclically perverse manner.[7]

The existence of a separate PIT would weaken the contra-cyclical contribution of provincial fiscal policy only if we may assume:

1 That the province would accept a revenue change initiated by federal changes under the existing joint PIT system, and
2 The province would initiate no change under a separate PIT in response to a federal action with the same federal revenue impact.

From the standpoint of economic analysis alone, such a situation could not arise, unless the administrative costs of changing provincial tax rates and other features of the tax system were high relative to the perceived benefit of the contra-cyclical policy. However, the politics of fiscal policy could well permit such a situation to arise. An anti-inflationary increase in provincial PIT revenues brought about by federal actions might be accepted, although this same increase in provincial revenues under a separate PIT might be rejected, because of the public's perception of who bears the responsibility for the policy. The treasurer of Ontario must defend his budget in the legislature. He is not similarly accountable for the automatic provincial tax changes triggered by certain federal initiatives under the joint system.

On the other hand, not all contra-cyclical initiatives are politically costly. With a separate PIT, the province could well adopt more extensive contra-cyclical policies. Certainly the increased flexibility under a separate PIT, by giving the province greater freedom to tailor tax actions to Ontario's circumstances, would argue for a more, not a less, effective contra-cyclical policy in the province, because adverse effects on other objectives might be better mitigated under the flexible PIT system.

IMPLICATIONS FOR A SEPARATE ONTARIO PIT

1 Stabilization policy is feasible for the Province of Ontario, with relevant Ontario expenditure multipliers about two-thirds of the national

multipliers and Ontario personal income tax multipliers about 60 per cent of the corresponding national multipliers.

2 General income tax changes, such as changes in the basic rate of personal income tax, are dominated by expenditure changes in terms of their impact on aggregate provincial demand. More selective tax measures, such as sales tax changes focussed on Ontario products, would also likely dominate general personal income tax changes in this respect.

3 Adoption of a separate PIT would permit introduction of more selective income tax measures.

4 Adoption of a separate PIT would facilitate implementation of supply-oriented policies (or permit demand management to be conducted with more of an eye to supply-side consequences).

5 Adoption of a separate PIT would not seriously affect the federal government's stabilization powers. Only the leverage of federal tax measures that affect 'basic federal tax' under the existing system would be reduced. This reduction in leverage could be readily offset by appropriate changes in the federal tax rate schedule.

6 The principal risk in the adoption of a separate Ontario PIT is that the province would be tempted to use more selective tax measures designed to attract demand (and to attract capital) from other provinces. This could trigger retaliatory measures by other provinces or indeed by the federal government itself. In the context of stabilization policy, where timing and credibility are critically important, such intergovernmental jockeying could reduce the net effectiveness of the policies adopted by the various levels of government.[8]

7 The flexibility of the existing joint system would be increased if the following steps were taken:

a Provinces were permitted to opt for a separate provincial tax rate schedule. Under this option, provincial taxes would be calculated on net income, and the exemptions, rates, and brackets would be determined by the province.

b All regionally non-discriminatory personal income tax credits were permitted. For example, savings and investment credits that did not discriminate against assets in other provinces would be allowed.

c Tax credits or surcharges applicable by type of income (business income attributed to the province, property income, or employment income) were permitted. This would, for example, enable tax reductions for certain classes of corporate business income to be paralleled for unincorporated business income.

d Regionally non-discriminatory deductions from taxable income were similarly permitted. This would, for example, permit the province to allow individuals to deduct the additional half of the first year CCA from their business or property income.

8 If items (a) through (d) above were all implemented, each cooperating province would obtain most of the flexibility of a separate PIT. What it would not get is freedom to impose regionally discriminatory tax credits or deductions, or the ability to tax sources of income not included (or partially exempt) in the federal income tax base, and conversely.

The federal government would presumably want to ensure that any such credits were established on a regionally non-discriminatory basis. This would preclude Ontario from introducing tax credits designed to attract investment from other provinces to Ontario. It can be argued that regionally biased policies are not in the long-run interest of Ontario in any case. The welfare losses from a system of discriminatory tax incentives are non-trivial, and the potential political fall-out is perhaps more serious. With its central location, Ontario has a clear interest in the maintenance of the Canadian common market in both products and factors of production with as little interference by provincial governments as possible.

APPENDIX
DETAILS OF ECONOMETRIC MODEL SIMULATIONS

1 Four fiscal actions were modelled under two monetary exchange rate regimes, making eight policy simulations in total. The various combinations are laid out in Table A1.

2 Each of these fiscal changes was incorporated into a five-year control solution of the FOCUS/PRISM system. This control solution was developed in February 1982 for the Ontario Economic Council (see Dungan and Crocker 1983).

TABLE A1
Fiscal action

Monetary policy rule & exchange rate system	Increase of $500 million 1971 dollars in federal spending on fixed capital	Equivalent[a] federal personal income tax reduction	Increase of $500 million 1971 dollars in Ontario spending on fixed capital	Equivalent[a] Ontario income tax reduction
Fixed exchange rate[b]; monetary policy geared to maintain exchange rate	S1M1A	S1M2A	S1M3A	S1M4A
Floating exchange rate; monetary policy geared to M1 targets[c]	S1M1B	S1M2B	S1M3B	S1M4B

a The tax reductions were designed to have the same impact effect on the relevant government deficit as the expenditure change: i.e., nominal tax changes deflated by the government spending deflator in S1M2A equal the real change in government spending in the S1M1A (before indirect effects).
b The exchange rate was fixed at the same levels as in the control solution of the FOCUS model.
c M1, the narrowly defined money supply, was fixed at the same level as in the FOCUS control situation.

Comparison of the simulation results with the control solution permits calculation of the multiplier effects of fiscal actions within the time frame of these simulations.

3 In each simulation, the first step was the solution of the FOCUS national model incorporating the proposed fiscal changes. Since no provincial detail is provided in FOCUS, each provincial fiscal policy simulation is equivalent to a corresponding fiscal policy simulation for most variables, as follows.

Federal policy simulation	Equivalent Ontario policy simulation
1A	3A
1B	3B
2A	4A
2B	4B

In the FOCUS model results, the only difference between each provincial

simulation and its equivalent federal counterpart is the respective sizes of the federal and provincial sector government deficits.

4 The solution of the PRISM model to derive regional results in the case of the federal policy experiments is straightforward. Since federal government spending on capital formation is assumed to have no regional bias, and the federal tax cut is a general across-the-board personal income tax cut, the PRISM model was solved recursively to the FOCUS model, yielding the normal industrial and provincial impacts of the regionally neutral federal policies.

5 The solutions of the PRISM model to derive the provincial results in the case of the Ontario policy simulations involved a number of adjustments to the PRISM model to reflect the geographic focus of government or consumer spending respectively.

In the government expenditure simulations, it was assumed that all of the 'first round' increases in non-residential construction spending were directed to Ontario, and that related non-tradeable primary production (non-metallic mineral mining, etc.) was similarly directed to Ontario. PRISM was then solved to derive the combined (direct plus indirect) effects of the fiscal changes on each province.

In the provincial personal income tax simulations, first round increases in consumer spending on non-tradeable items (services and food and beverages) were directed to relevant Ontario industries. PRISM was then solved to derive the total effects of the tax changes.

NOTES

1 But see Prichard, et al. (1983).

2 For detailed descriptions of the FOCUS and PRISM models, see Institute for Policy Analysis (1982a,b).

3 Note that in the floating exchange rate case, the crowding-out effects are much weaker, since the expansionary fiscal policy does not necessitate a restrictive monetary policy to defend the exchange value of the Canadian dollar. Hence the five-year expenditure multipliers under floating exchange rates reveal the opposite relationship between the national and Ontario multipliers.

4 These results may be contrasted with the results obtained by Fortin (1982) on the basis of a static Keynesian model of regional economies. For an expenditure injection, Fortin finds the Ontario multiplier is 76 per cent of the national multiplier.

5 'Inside lag' refers to delays that result because of the time that elapses between steps in the decision making-approval-implementation process.

6 For discussion of the effects of the evolution of fiscal federalism in

Canada on the leverage of federal government fiscal instruments, see Auld (1980) and Barber and Wilson (1980).

7 For an analysis of the implications of the growth of provincial budgets for built-in stability, see Fortin (1982). For empirical evidence on the cyclical behaviour of provincial budgets, see T.R. Robinson and Courchene (1969).

8 A set of proposals that would potentially increase the provincial capacity effectively to carry out stabilization policies on a non-discriminatory basis is included in the appendix.

REFERENCES

Auld, D.A.L. (1980) 'The scope for short-run fiscal stabilization policy within Confederation.' In R.M. Bird, ed. Fiscal Dimensions of Canadian Federalism (Toronto: Canadian Tax Foundation)

Barber, Clarence, and Thomas A. Wilson (1980) Comments on 'The scope for short-run fiscal stabilization policy within Confederation.' In R.M. Bird, ed. Fiscal Dimensions of Canadian Federalism (Toronto: Canadian Tax Foundation)

Canada (1982) Inflation and the Taxation of Personal Investment Income (Ottawa: Department of Finance)

Canada, Royal Commission on Taxation (1966) The Use of the Tax System to Achieve Economic and Social Objectives (Ottawa: Queen's Printer)

Dungan, Peter, and Douglas Crocker (1983) The Ontario Economy 1982-1990 (Toronto: Ontario Economic Council)

Fortin, Pierre (1982) The Comparative Size of the Federal and Provincial Budgets and Economic Stabilization (Ottawa: Economic Council of Canada)

Institute for Policy Analysis (1982a) FOCUS: Forecasting and User Simulation Manual and Equation Description (Toronto)

- (1982b) PEAP Models Documentation (Toronto)

Prichard, J.R.S., et al. (1983) Federalism and the Canadian Economic Union (Toronto: Ontario Economic Council)

Robinson, T.R., and T.J. Courchene (1969) 'Fiscal federalism and economic stability: an examination of multi-level public finances in Canada, 1952-1965.' Canadian Journal of Economics vol. 2, no. 2, 165-89

Wilson, T.A. (1977) 'The province and stabilization policy.' In Ontario Economic Council Issues and Alternatives: Intergovernmental Relations (Toronto)

A Provincial Personal Income Tax Surcharge for Municipalities

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Although the Canadian federal government did not impose an income tax until 1917, the provinces and municipalities levied income taxes as early as the 1830s. This provided an important source of revenue to municipal governments until 1941, when the provinces entered into the Wartime Tax Rental Agreements with the federal government. Since that time, municipal governments have not been able to levy income taxes - indeed, local governments are actually legally forbidden to collect income taxes.

In recent years, however, one province (Manitoba) has allowed municipal governments to 'piggyback' onto the provincial income tax in the same way that the provinces (with the exception of Quebec) piggyback onto the federal income tax.[1] Some other provinces have been involved in a form of revenue sharing whereby a portion of their personal income taxes has been earmarked for municipal governments. Of course, in both cases, it is not required that the province have its own personal income tax system - municipalities can piggyback onto current provincial income taxes, as collected by the federal government.

The purpose of this paper is to consider the desirability of a provincial personal income tax system that would allow municipalities to place a surcharge on provincial income taxes. The desirability of a surcharge will be considered from the perspective of the provincial government, the municipal governments, and individual taxpayers. Several different surcharge schemes will be evaluated in terms of equity, efficiency, administration, and political criteria.

The paper is divided into five main sections. The first section describes the existing municipal fiscal structure in Ontario and shows that

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municipalities depend largely on property taxes and provincial grants to finance local expenditures. Surcharge schemes in other provinces and states are also described in this section.

The second section presents the taxation issues. First, the base of the surcharge has to be determined; that is, whether it will be the personal income tax or the corporate income tax as well. Second, the rate of surcharge has to be determined; this section discusses the advantages and disadvantages of using one rate for all municipalities in the province as opposed to different rates for different municipalities.

The third section looks at various delivery mechanisms that the province could use to return the funds collected to the municipalities. On the one hand, the province could merely return the funds collected from any municipality, with the province acting as a collection agency in the same way that the federal government does for the provinces. On the other hand, the province could return the funds according to a particular formula in order to achieve equalization across municipalities or other objectives. This section evaluates the various economic (and other) rationales for distributing funds from one level of government to another and then considers the appropriate grant design to achieve these different objectives.

The fourth section considers the impact of a piggyback scheme on the finances of municipalities. The effect will depend on whether this source of revenue is substituted for property taxes or for existing provincial grants or whether it provides additional revenues to municipalities. The impact on individual taxpayers is also examined.

MUNICIPAL FISCAL STRUCTURE IN ONTARIO

Municipalities in Ontario depend largely on property taxes and provincial grants to finance a vast array of local services. As Table 1 shows, for the total local sector in 1980, property taxes and provincial grants each accounted for almost 40 per cent of total local revenues. The remaining 20 per cent was composed of specific user fees, other revenues, and borrowing. It can also be seen from this table that property taxes have grown relatively more quickly over the last few years (1977 to 1980) than have provincial grants (32 per cent for property taxes compared to 23 per cent for provincial grants). In the early 1970s, provincial grants increased significantly in an effort to reduce reliance by municipalities on the supposedly regressive property tax. This trend seems to have reversed

TABLE 1
Local government revenues, Ontario, 1977-80

	1977		1978		1979		1980		1977-80
	($ million)	(%)	($ million)	(%)	($ million)	(%)	($ million)	(%)	% change
Municipalities									
Taxation	1,663	34.0	1,785	34.7	1,967	35.1	2,165	35.3	30.2
Ontario grants	1,525	31.2	1,626	31.6	1,747	31.2	1,921	31.3	26.0
Specific user fees	639	13.1	725	14.1	810	14.5	906	14.8	41.8
Other revenue	591	12.1	749	14.5	762	13.6	852	13.9	44.2
Borrowing	467	9.6	268	5.2	314	5.6	290	4.7	(37.9)
TOTAL	4,885	100.00	5,152	100.0	5,600	100.0	6,134	100.0	25.6
School boards									
Taxation	1,526	42.9	1,663	43.5	1,831	44.9	2,048	45.4	34.2
Ontario grants	1,908	53.7	1,992	52.1	2,092	51.3	2,317	51.4	21.4
Other revenue	64	1.8	82	2.1	96	2.4	99	2.2	54.7
Borrowing	58	1.6	87	2.3	60	1.5	45	1.0	(22.4)
TOTAL	3,556	100.0	3,824	100.0	4,079	100.0	4,509	100.0	26.8
Total local sector									
Taxation	3,189	37.8	3,448	38.4	3,798	39.2	4,213	39.6	32.1
Ontario grants	3,433	40.1	3,618	40.3	3,839	39.7	4,238	39.8	23.4
Specific user fees	639	7.6	725	8.1	810	8.4	906	8.5	41.8
Other revenue	655	7.8	831	9.3	858	8.9	951	8.9	45.2
Borrowing	525	6.2	354	3.9	374	3.9	335	3.2	(36.2)
TOTAL	8,441	100.0	8,976	100.0	9,679	100.0	10,643	100.0	26.1

SOURCE: Local Government Finance 1980.

itself, however, in the late 1970s. Since the province has significantly cut back on the growth of provincial-municipal transfers, local governments in Ontario have depended increasingly on property taxes.[2]

Both property taxes and provincial grants have been subject to considerable criticism since the Smith Committee (Ontario Committee on Taxation) reported in 1967. Very briefly, property taxes have been attacked for being regressive because they bear relatively more heavily on low income families than on high income families.[3] They are not considered to be benefit-related because they are used, to some extent, to finance services unrelated to property (for example, education and welfare). They are inelastic in that they do not grow automatically over time as the economy grows and, finally, they are considered to distort the allocation of resources because they discourage investment in improvements to property.[4]

Provincial grants in Ontario have been criticized for being too complex, for creating uncertainty and confusion among recipients, for impairing local autonomy, for distorting local expenditure decisions, and for containing inconsistent equalization provisions. Table 2 shows the breakdown of grants according to whether they are conditional (have to be spent on particular functions) or unconditional (can be spent on anything). This table hides many of the complexities of these grant programs - there are over 80 different grants in total, some going directly to the municipality, others to boards or agencies of the local government. Each grant has a unique formula and its own eligibility provisions. Table 2 does show, however, that unconditional grants form a fairly small share of total grants - 11 per cent in 1980, 14 per cent in 1981, and an estimated 13 per cent in 1982. Despite provincial statements that more grants would become unconditional, with no strings attached, the numbers show that the vast majority of grants remain conditional.[5]

From the provincial perspective, the demand for increased grants by municipalities puts increasing pressure on provincial revenues at a time of restraint. Table 3 shows that, although the growth in provincial-municipal transfers has moved in the same direction as provincial government revenues, this growth has consistently lagged behind in terms of magnitude.[6]

It would seem, then, that both provincial and municipal governments might welcome an alternative source of revenue for municipalities, one that grew automatically over time and that did not put additional pressures on provincial revenues. By allowing municipalities to piggyback onto the

TABLE 2
Payments to local governments and agencies ($ million)

	Actual 1980-81	Interim 1981-82	Estimated 1982-83
Conditional payments			
Grants to school board			
General legislative grants	2,141	2,504	2,715
School capital grants	46	61	67
Transportation			
Roads	418	450	475
Transit	133	175	198
Other	2	2	3
Social assistance			
General welfare assistance	224	253	257
Children's aid societies	115	131	146
Homes for the aged	107	130	145
Day nurseries	40	50	58
Other	7	7	8
Health			
Local health units	60	69	83
Other	21	22	25
Environment	69	115	93
Municipal affairs and housing	83	107	84
Agriculture	55	76	65
Conservation authorities	39	36	37
Library boards	23	25	26
Recreation	15	14	18
Northern affairs	19	14	15
Short-term job creation	-	-	53
Other conditional payments	6	16	12
	3,623	4,257	4,583
Unconditional payments			
General support	87	178	201
Resource equalization	143	164	178
Per capita - policing	87	110	113
Per capita - general	39	113	62
Northern Ontario support	24	49	55
Payments-in-lieu of taxes	54	60	70
Other	18	23	20
	452	697	699
TOTAL TRANSFER PAYMENTS	4,075	4,954	5,282

SOURCE: Ontario Budget, 1982.

TABLE 3
Growth in provincial-municipal transfers, 1976-80

	1976-77	1977-78	1978-79	1979-80	1980-81
Provincial expenditures ($ million)	11,743	12,920	12,920	13,913	17,273
Growth in provincial expenditures (%)		10.0	7.7	13.8	9.1
Provincial revenues ($ million)	10,514	11,099	12,322	15,246	16,470
Growth in provincial revenues (%)		5.6	11.0	23.7	8.0
Provincial-municipal transfers ($ million)	3,407	3,388	3,652	4,051	4,075
Growth in provincial-municipal transfers (%)		0.5	7.8	10.9	0.6

SOURCE: Ontario Budget, various years.

provincial income tax, the province would, in effect, have an earmarked tax. Revenues, by definition, would always be available to transfer to municipalities. From the municipal perspective, municipalities would be able to tap a revenue source that would grow over time.

A distinction should be made between municipally determined local income taxes, which piggybacking makes quite feasible, and provincial revenue sharing where the province sets aside for local governments a provincially determined portion of its income (or other 'growth') taxes. Both are discussed below.

Some provinces, recognizing that municipal revenues do not grow automatically over time, have initiated schemes whereby municipalities are given access to provincial 'growth' taxes. For example, since 1978-79, British Columbia has turned over the proceeds to municipalities of 1 per cent of individual income tax, 1 per cent of corporate taxable income, and 6 per cent of the sum of gasoline, diesel fuel, coloured gasoline, fuel oil, and sales taxes, lands and forest revenues, mineral revenues, and net proceeds from the sale of natural gas (Canadian Tax Foundation 1981). These funds are given back to municipalities as grants - some unconditional and some conditional.

In Manitoba, the province abates 2.2 percentage points of provincial personal income tax and 1 percentage point of corporation income tax. The funds are transferred to municipalities on a per capita basis. Additional percentage points can be abated at the request of a majority of municipal governments.

The Manitoba scheme results in an implicit equalization grant to municipalities, since it is on a per capita basis. The province collects relatively higher income taxes per capita from richer municipalities than from poorer municipalities, where 'richer' and 'poorer' are defined in terms of the income tax base. When all of the revenues are collected and pooled and the funds transferred back, all municipalities receive the same average per capita tax collected. In other words, richer municipalities receive less than was collected from them while the opposite is true of poorer municipalities.

Saskatchewan has also had a provincial-municipal revenue sharing scheme since 1978 under which municipal governments are given access to provincial 'growth' taxes.[7]

Piggyback schemes have been used by municipal and state governments in the United States as well. Baltimore and counties in Maryland

piggyback onto the state income tax. Each local government establishes its own rate as long as it falls within the range of 20 to 50 per cent of the state tax. Bernalillo County has a similar arrangement with respect to the New Mexico state income tax.[8] In Wisconsin, the state puts approximately 40 per cent of its state income taxes into a fund reserved for local governments. This implies a uniform surcharge scheme for all the municipalities in the state and state distribution of funds according to its own formula.

TAXATION ISSUES

The first issue is whether to place the surcharge on corporate income taxes as well as personal income taxes.[9] An additional surcharge for municipalities on the corporate income tax would result in consequences that are very similar to those of the non-residential property tax, since both are taxes on the commercial and industrial sector. Thus, the literature on the economic impact of non-residential property taxes applies.[10]

A surcharge on the corporate income tax, in addition to being borne by capital sources, would be borne, in part, by workers in the form of lower wages and salaries. Also, the tax would be borne by consumers inside and outside of the taxing jurisdiction in the form of higher prices for goods and services produced. To the extent that the tax is borne by people in other jurisdictions, the tax can be said to be exported to non-residents. This may not be an insignificant amount - Thirsk found that, for all municipalities in Ontario, the average rate (unweighted) of tax exporting of the non-residential property tax was 56 per cent. In other words, more than one-half of non-residential property taxes are exported to other jurisdictions.

On benefit grounds, it is not desirable to export local taxes to non-residents. According to the benefit principle, local residents should pay local taxes since they receive the benefits provided by local government expenditures. Also, as Thirsk (1981) argues, exporting of local taxes represents a transfer of income from non-residents to residents that is not based on need, fiscal capacity, or spillover of benefits from local expenditures. Of course, as is noted below, tax exporting may be desirable on political grounds. In any event, it is felt that a piggyback arrangement for municipalities should be based solely on the personal income tax.

The second taxation issue that has to be addressed is the rate of

surcharge. Either one rate could be used for the whole province, in which case there would simply be a system of revenue sharing or, alternatively, each municipality could be allowed to levy its own rate, in which case there would truly be a local income tax.

Locally determined rates would result in efficiency and equity effects similar to those of provincially determined income tax rates. For example, it might be expected that people would relocate in response to differential tax rates. However, local jurisdictions are so much closer to each other than are provincial jurisdictions that one would expect behavioural responses to be much greater in the case of local jurisdictions. People and businesses would, with differential rates, have an incentive to locate in neighbouring jurisdictions to avoid the tax. In order to minimize the effect on migration, a very low range of rates would have to be specified.

The issues related to the question of whether the province should levy its own personal income tax and the issues concerning local income taxes are somewhat similar, but because of the size and proximity of local jurisdictions and the types of expenditure functions they undertake, the concerns are not completely analogous.

There has been no empirical literature on the effects of a piggybacked tax on residential or industrial location and only a little on the impact of local income taxes (see Rodgers 1981). What literature there is suggests that the impact on location is small. One would expect that differentials within a metropolitan area would cause greater locational adjustments than differentials between metropolitan areas. In reality, the effect of differential rates is difficult to assess since it depends on the size of the differential, the geographic size of the municipalities, the expenditures in the municipalities, as well as other factors.

There is an argument for locally determined property tax rates, however. The decision on where to live, given job location, depends on both the taxes payable in a jurisdiction and the services provided. Municipalities can be regarded as local benefit units among which potential residents shop before locating in that jurisdiction in which the tax-expenditure package most closely resembles their preferences. In this 'Tiebout' world (see Tiebout 1956), the property tax represents the price of living in a particular jurisdiction. Since the property tax is at least somewhat related to the benefits received, it is more appropriate than differential income tax rates. Thus, even with a piggybacked income tax, there is still a role for the property tax.

The treatment of commuters also becomes important under a system of locally determined income tax rates. Should commuters be taxed and if so how much? If they are taxed, should these taxes be credited towards taxes paid in the jurisdiction in which they live? On benefit grounds, it can be argued that, since commuters enjoy some services in the municipalities in which they work, they should pay some tax in that jurisdiction. However, given this argument, they should probably pay less than residents, since they presumably enjoy less services. In many American cities, commuters are taxed at a reduced rate. On efficiency grounds, however, only by taxing commuters the same amount as residents will there be no incentive to relocate.[11]

One possibility would be to tax residents on their income from all sources and tax commuters only on the income they earn in the taxing jurisdiction. By trying to achieve both benefit and ability-to-pay goals, however, neither might be satisfied. The tax on non-residents might be higher than the benefit argument would suggest, and the tax on residents might be lower (and less progressive) than the ability argument would support. The administrative costs of dealing with taxation of commuters would be fairly significant, especially if combined with a tax credit toward taxes in the jurisdiction in which they live.

The main arguments in favour of locally determined rates are concerned with local autonomy and local fiscal responsiblity. Municipalities would have more flexibility in determining how much revenue to raise and would also be directly responsible to the electorate for tax rate decisions. Under a uniform surcharge scheme, each municipality would levy the same rate and there would be no opportunity to charge non-residents different amounts. This might not be desirable from the point of view of large municipalities that provide employment and shopping opportunities to a large proportion of non-residents but it would be much simpler administratively.

Under a scheme of locally determined rates it would be expected that the province would distribute these funds back as collected. The province might then want to provide some sort of equalization grant to poorer municipalities so that they could provide an adequate level of services. The current resource equalization grant would likely not be sufficient. These issues are discussed further below.

To summarize, despite local autonomy and fiscal responsibility arguments, locally determined surcharge rates are not recommended because

they would likely affect locational decisions and make the treatment of non-residents very complex. In addition, the general administrative costs would be higher than under a uniform surcharge scheme. For these reasons, it is felt that the uniform scheme (that is, revenue sharing) would probably be more appropriate for municipalities in Ontario.[12] In any event, it would seem highly unlikely that the province would allow different surcharge rates for different municipalities, given the autonomy this would offer local decision-makers.

An income tax for municipalities piggybacked onto the provincial scheme would have many advantages. It would be visible to taxpayers, as is the current property tax. Thus the criteria of political responsibility and accountability would be satisfied (although somewhat less so than with locally determined rates). If it reduced the property tax, it would be desirable on equity grounds. Regardless of one's view of property tax incidence, the income tax is still considered to be a more progressive tax. Unlike the property tax, which is not benefit-related for the so-called 'soft services' (education, welfare, etc.), but is somewhat benefit-related for the 'hard services' (water, sewers, and so on), the income tax is not at all related to the benefits received from local expenditures. Finally, probably the most important consideration for municipal governments is the elasticity of the income tax. Income tax revenues would almost certainly increase more rapidly over time than would property taxes.[13] With respect to property taxes, assessed property values do not increase automatically as market values increase, thus these revenues do not grow automatically. Increases in property taxes imply rate changes - and all of the political fall-out that goes with rate changes.

Table 4 gives an indication of the magnitude of revenues that could be collected by looking at what would have been collected by municipalities in Ontario for selected years. This assumes a 1 per cent surcharge on the federal basic tax payable and a 1 per cent surcharge on corporate taxable income.[14] For 1979, for all municipalities in Ontario, the surcharge would have brought in almost $168 million in revenues or about 3.4 per cent of total municipal revenues from own sources.[15] Turning back to Table 1, it can be seen that a fairly significant surcharge rate (almost 50 per cent for the total local sector) would be required to replace property tax revenues or provincial grants.

Although a piggyback scheme is used in Manitoba to some extent, one of the major obstacles to wider use is that the income tax is already the

TABLE 4
Potential revenues from piggybacking onto provincial personal and corporate income taxes, Ontario, selected years

	1968	1971	1975	1979
Revenues ($,000)	48,142.2	66,922.0	126,039.6	167,802.0
Per cent of own source revenue (%)	3.0	3.4	4.2	3.4

NOTES: 1 per cent to corporate taxable income (Corporation Taxation, Statistics Canada, Catalogue 61-208).
1 per cent to federal basic tax payable (Taxation Statistics, Revenue Canada).
Own source revenue figures are from Local Government Finance, Statistics Canada, selected years.
SOURCE: Kitchen (1982, 785).

major source of revenue to the federal and provincial governments. Also, as Break (1980, 54) notes, it is by no means certain that local taxpayers would prefer a tax that fell clearly on local residents to property taxes and especially non-residential property taxes, which could to some extent be exported to other jurisdictions.[16]

A uniform surcharge collected by the province and turned back to the municipalities is very much like a grant program. The municipality has no discretion over the rate of tax and it cannot alter its behaviour to change that rate. The impact on municipal finance depends to a large extent on the way in which the province chooses to turn back the funds to the municipality. This is discussed in the next section.

ISSUES RELATING TO DELIVERY MECHANISMS

Assuming that municipalities all levy the same rate of surcharge on provincial personal income taxes (as discussed above), and that the province collects these revenues, the next issue is how the funds are turned back to municipalities. The province could merely act as a collection agency, in which case funds collected from any particular municipality would go back to that municipality. This system is currently used by the federal government vis-à-vis the provinces. The main advantage of this arrangement would be the local autonomy it would provide for municipalities. They could spend exactly the amount of funds collected in their jurisdictions - the richer the municipality, the more funds it would have to spend.

It could be the case, however, that the province would want to pursue an equalization objective. For example, on equity grounds, the province might want each municipality to be able to provide some 'average' level of service (where 'average' represents the average for all municipalities in the province).[17] This would mean that the surcharge rate would be the same for all municipalities but, since the base on which the rate was levied would vary across municipalities, more taxes would be collected from relatively rich municipalities. A grant formula could determine the 'average' collected in the province (which would determine the 'average' level of service) and return that amount to each municipality. In a poor municipality, for example, less taxes would be collected than grants received (and expenditures made), and thus the municipality would be relatively better off under this scheme. Alternatively, the funds could be handed back as allocated and the province could have an additional equalization grant.[18]

The distribution of revenues to local government depends largely on the preferences of the province, but there are some economic principles that are relevant to the design of transfer formulas. The two main economic justifications for grants are on allocative grounds (to affect the level or mix of expenditures) and on redistributive grounds (to achieve fiscal equalization among local governments). In the first case, the objective of the donor government would be to encourage spending on particular goods and services so that levels of service would be augmented to some degree beyond that selected under purely local provision. With respect to redistribution, the provincial government's objective might be to achieve some sort of equalization among jurisdictions, where equalization would be of need, fiscal capacity, fiscal performance, fiscal effort, or some combination of these.

On allocative efficiency grounds, the provision of a particular service (for example, education) may result in spillover benefits to other municipalities. A person educated in Toronto may go to live and work in Oshawa, taking the benefits of his education with him. An interjurisdictional spillover (or externality) of this sort can lead to a misallocation of resources. The municipality providing the service generally considers only the benefits to its own residents when it determines how much of the service to supply. It will, in the case of a spillover benefit, provide too little of the service. Society as a whole would be better off if more of the service were provided, but the municipality has no incentive to consider

the external benefits.

Improving allocative efficiency would require a mechanism to encourage expansion of the activity to account for external benefits. One possibility would be a subsidy to the municipality generating the spillover. A matching grant whereby the province paid a percentage of the expenditures on the good or service would be appropriate.[19] The matching rate (percentage of expenditures) would represent the ratio of external benefits to total benefits.[20] By altering the price of the service to the municipality providing it, the grant would provide an incentive to expand it.

The second rationale for transfers is fiscal equity. One municipality may not be able to provide the same level of public services at the same tax rate as another jurisdiction. This may be the case because tax bases differ across jurisdictions, so that a municipality with a low tax base has to levy a higher tax rate than a municipality with a high tax base. Alternatively, the costs of providing certain public services may be higher in one municipality than in another, so that a larger tax yield is required to provide the same level of services. Finally, the need for particular services may be greater in one municipality than in another, necessitating larger expenditures and consequently a greater tax yield in the former municipality.

Achieving fiscal equity would require lump sum unconditional grants to the poorer municipalities, so that all municipalities could provide a given level of public services at the same rate of tax. 'Lump sum' grants do not have to be matched by the municipalities; 'unconditional' grants do not have to be spent on a particular function. The grant would likely depend on such measures as the need and the taxable capacity (ability to raise taxes) of the municipality. Various possible formulas are considered below.

In addition to the economic justifications for intergovernmental transfers, there may be other reasons why the province might want to transfer funds to municipalities. The province tends to have greater taxing ability than local governments, since the latter are restricted by the circumstance that labour and capital can avoid a tax by moving to another municipality. It is somewhat more difficult to avoid a tax imposed by a higher level of government. Also, there are economies of scale in tax administration which can be more adequately taken advantage of by a more central government.

Transfers are also often justified on the basis of the 'fiscal gap'

argument. Lower levels of government often face a mismatch of revenues and expenditures because expenditure demands are rising more quickly than are revenues (at given tax rates). There is thus a 'fiscal gap' (Boadway 1980) between spending responsibilities and taxing powers.[21] Unconditional transfers would increase the revenues of municipal governments - so would additional revenue sources (for example, piggybacking onto the provincial personal income tax and having the revenues turned back as collected). Alternatively, the province could take over some municipal expenditure functions.

Another argument for intergovernmental transfers is that upper level governments want local governments to provide their own services but at the same time want to maintain control over how the money is spent and to establish certain minimum levels of these services (Gramlich 1976). One instrument for achieving this dual purpose is a conditional, matching grant which is closed-ended (that is, has a limit on the amount of funds available). A conditional, matching grant alters the price of a particular service to the municipality, thereby encouraging spending on that service. By making these grants closed-ended, the province is also able to control the amount of funds it gives out in grants. These transfers can be thought of as a device whereby local governments act as agents or contractors for the province in carrying out specific tasks (Schultze 1974).

Other reasons why grants actually do exist have been expressed in the literature. Briefly, it has been argued that an upper level government gives grants to lower level governments so that it can be identified with the services provided by the lower level governments (Winer 1979). Another reason cited is that the central government has surplus tax revenues because it has greater taxing powers relative to expenditure requirements than do local governments (Breton and Scott 1978). The local governments have inadequate revenues to meet their expenditure needs.[22] The result is that those levels with surplus tax revenues are assumed to enter an imagined trade as buyers of 'expenditure functions', while those with inadequate tax revenues enter as sellers of those functions. Grants are treated as 'the price of traded functions'. These and other justifications are discussed more fully elsewhere (see Slack 1980a).

The distribution of piggybacked funds to municipalities would depend on the preferences of the province. As stated above, the two main economic justifications for grants are allocative efficiency and redistribution. The next step is to summarize various grant formulas designed to meet

different provincial objectives.[23]

In the following examples, a number of assumptions have had to be made. Each jurisdiction provides only one service. Taxes in a particular jurisdiction are borne by its residents and are not shifted to non-residents. Benefits from expenditures do not spill over into other jurisdictions. All expenditures are tax financed; there is no borrowing. There is full employment, and, lastly, policies in one jurisdiction do not lead to retaliation by other jurisdictions.

Grant formulas can be designed to achieve various equalization objectives. One possible objective would be to equalize fiscal capacities of municipalities. This would mean that the province would collect different amounts of income tax revenues from each municipality and return the average revenue collected.[24]

The formula for the subsidy would be as follows:

$$S_i = t_s (\bar{B}-B_i), \qquad (1)$$

where

S_i = subsidy to municipality i
t_s = uniform surcharge rate
$\bar{B}$ = average income tax base in the province
B_i = income tax base in municipality i.

The differences in taxes collected in different municipalities (t_sBi) would entirely reflect differences in the tax base, since the rate of surcharge (t_s) would be the same for all municipalities.[25]

This grant would mean that municipalities with a relatively large tax base would be able to spend less than was collected from them in taxes, and that municipalities with a relatively small base would be able to spend more than was collected from them.[26] Redistribution would take place from high tax base municipalities to low tax base municipalities.

Since the surcharge rate is assumed to be the same for all municipalities, the above grant would apply equally if the objective were to equalize expenditures.[27]

The formula would be:

$$S_i = ET_i - t_s B_i, \qquad (2)$$

where

ET_i = expenditures made out of income tax revenues in muncipality i.

The province would collect income tax revenues and again calculate the average amount to be turned back to municipalities. The average expenditures per municipality (made out of income tax revenues) would equal the average tax revenues collected, and, since the tax rates would be the same, equalizing across taxes would be the same as equalizing across the tax base. Redistribution would be from high tax municipalities to low tax municipalities.

One problem with equalizing expenditures or equalizing fiscal capacities is that no account is taken of the needs of the municipality. Thus, another objective might be to equalize need and fiscal capacity.[28]

It is generally assumed that the population of a municipality reflects its needs - i.e., that larger municipalities have greater needs. So population is used as a proxy for need.

The formula to equalize need and fiscal capacity would be as follows:

$$S_i = t_s (\bar{B}^{pc} - B_i^{pc}), \qquad (3)$$

where

$\bar{B}^{pc}$ = average per capita tax base

B_i^{pc} = per capita tax base in municipality i.

In this case, redistribution would be from low need/high tax base municipalities to high need/low tax base municipalities. In the event that the tax base in a municipality equalled the average tax base ($B_i = \bar{B}$), the subsidy would be greater as the need (measured by population) was greater. Similarly, if the need was equal to the average need (pci = pc), then the subsidy would be greater, the greater the difference between the tax base in municipality i and the average tax base. The grant could be modified so that larger municipalities received more per capita, on the grounds that, beyond a certain size, diseconomies of scale come into effect.

The foregoing grant designs have dealt explicitly with the equalization objective. Other formulas which could be used to equalize fiscal effort (tax rates) do not apply here, since it is assumed that each municipality levies the same surcharge rate. There is no flexibility to alter that rate under this system, so it is meaningless to design a grant based on fiscal effort.

A further provincial objective might be to allocate resources efficiently. In this case, the grant would be matching - the province would provide a certain proportion of expenditures on a particular good or service. By reducing the price of the aided good or service, these grants would provide incentives to increase service levels.

The following subsidy formula could be used:

$$S_i = kE_i - t_s B_i, \qquad (4)$$

where

k = matching rate (%)

E_i = expenditures by municipality i[29]

$\max S_i = t_s \bar{B}$.

Under this grant formula, the province would match expenditures made by municipalities on particular functions. The subsidy would be the matched amount minus the taxes collected from the municipality. To ensure that the province used up the funds collected, that amount would be specified as the maximum available for the designated functions ($S_i = t_s \bar{B}$).

Although the intention of this grant would not be redistribution, there would be some redistribution across municipalities. For example, municipalities which made relatively larger expenditures (up to the maximum available for the grant) would receive relatively larger grants. Also, the subsidy would be greater, the smaller the tax base of the municipality.

The above examples have shown how grants can be designed. Other formulas could also be considered, the choice depending on the objectives of the province. For example, a transfer could be designed to take account of the commuter problem. A formula could be based on the number of people employed in a municipality instead of on the resident

population. Again, assuming that one surcharge rate were used for all municipalities, the most appropriate formula would be one that took into account both the fiscal capacity of the municipality and its needs.

The introduction of provincial-municipal revenue sharing in Ontario provides a good opportunity for redesigning the entire grant system (not just revenues based on an income tax surcharge). Based on the economic arguments above, it would be desirable to reduce the number of conditional grants so that what remains are only matching grants which attempt to internalize spillovers. This would mean that matching grants would only be provided for those services which result in spillovers and the rate of grant would reflect the amount of spillover.[30] Unconditional grants, which would provide the vast majority of intergovernmental transfers, would be based on fiscal need as well as fiscal capacity. Fiscal need would be reflected by population; fiscal capacity would be based on all revenue sources to municipalities.

IMPACT OF PIGGYBACKING ON MUNICIPAL FINANCES AND INDIVIDUAL TAXPAYERS[31]

The preceding discussion has made no assumptions concerning the role of piggybacked funds in the finances of municipalities. For example, would these funds be additional to current sources of finance or would they replace existing sources? The answer to this question would determine, in part, their impact on local fiscal decision-making and on individual taxpayers.

It is unlikely that income taxes collected by the province would be directly substituted for property taxes collected by the municipalities. In other words, the province would have some difficulty in ensuring that income taxes would replace property taxes unless this were explicitly legislated. However, municipalities might, as part of their response to income tax revenues, reduce property taxes. In other words, they would substitute income tax revenues for property tax revenues. To the extent that this occurred, the change would be progressive from the point of view of individual taxpayers. Greater reliance on the progressive income tax would be more favourable on equity grounds than reliance on the supposedly regressive property tax. As noted previously, however, there is still a legitimate role for the property tax in the local fiscal system, at least to finance the hard services.

Income tax revenues could also provide an additional source of revenue to municipalities or replace existing unconditional or conditional grants. Although it is not clear what the effect of a change in revenue sources would be on local fiscal decisions, there is a substantial empirical literature which looks at local fiscal response to different types of intergovernmental transfers (see Slack 1980b). It has been shown empirically that unconditional transfers are, to some extent, substituted for property taxes (ibid.). Rather than using these grants to make expenditures, they are used to reduce property taxes. This result indicates that income tax revenues distributed as unconditional grants could be used to reduce (or replace) property taxes.

On the other hand, it has been found that conditional grants are very stimulative - expenditures on particular functions have increased in response to conditional grants, sometimes by an amount larger than the grant. This means that property taxes generally have to be increased to help finance the additional expenditures. This implies that the introduction of income taxes which would be distributed back as conditional grants could actually increase property taxes!

To summarize, if income tax revenues provide additional funds to municipalities, the local fiscal response will depend on the distribution mechanism. Whether the funds are transferred conditionally or unconditionally will determine whether local expenditures will increase or decrease and, similarly, whether property taxes will increase or decrease. Substituting income taxes for property taxes will be a progressive change; the result of using income taxes to increase expenditures is unclear, depending as it does on the benefit incidence of these expenditures.

It is very likely that income tax revenues collected by the province will be used to replace existing grant programs.[32] If they were used in this manner and the composition of grants remained the same (conditional vs. unconditional), there would be little change from the current situation. Provincial transfers to municipalities now come from general provincial government revenues. Since the largest component of these revenues is made up of the personal income tax, it seems that the distributive effect of changing to a system of grants from income tax revenues alone would be minimal. From the municipal perspective, the breakdown of revenues according to property taxes and grants would remain unchanged.

The role of the current resource equalization grant in this new system also has to be considered. This grant from the province provides

funds to poorer municipalities on the basis of their property tax assessments. As has been well documented, assessment in Ontario is highly inequitable, since it is not based on true market values.[33] Thus, the resource equalization grant, which is based on flawed assessed values, is highly inadequate as an equalization tool. One possibility might be to replace it, at least until the assessment system is improved, by redistributing piggybacked income taxes through an equalization grant based on the income tax base. In any event, the delivery mechanism chosen for income tax revenues would have to take into account the redistribution through the resource equalization grant.

The main difference between the current system and a piggybacking scheme is in the income elasticity of the revenues they provide to municipalities. Currently, the province determines the rate of growth of provincial grants annually. This system results in much uncertainty for municipalities, which cannot make expenditure decisions until they know how much they will receive in grants. As shown in Table 3, provincial grants tend to move in the same direction as provincial revenues but not proportionately. From the provincial perspective, the demand for increased grants by municipalities puts increasing pressure on provincial revenues. Under the piggyback system, municipalities would be ensured that this source of revenue would grow as the economy grew. The province would have a pool of funds to rely on for provincial-municipal transfers and would not have to be concerned with determining the magnitude of grants each year.

A piggybacking scheme of this sort would be very much like an earmarked tax: the revenues collected from a specified percentage of provincial taxes payable would be earmarked for provincial-municipal transfers. As has already been stressed, this system would have one basic advantage over the current system: it would provide municipalities with an elastic revenue source.[34]

One final point - the response of the province also has to be considered. It has been assumed that the provincial government would abate tax points to the municipalities. In other words, the provincial tax rate would be reduced by the amount of the municipal piggyback surcharge rate. It is possible, however, that the province would merely add the surcharge rate onto its own tax rate, in which case provincial revenue and expenditures would increase. It is beyond the mandate of this study to consider the impact of such a response.

NOTES

1 As will be noted below, there are some differences between the two piggyback schemes, most notably that the federal government acts merely as a collection agency for the provinces whereas the provinces act as granting agents to municipalities.

2 Table 1 also shows the differences between municipal and school board finances. Ontario grants have accounted for a much larger portion of school finance (over 50 per cent) than general municipal finance. School boards determine their own tax rates in Ontario and then levy the municipalities which collect tax revenues on their behalf.

3 Although the political perception is that the property tax is regressive, the theoretical literature is not as definitive. See Bird and Slack (1978).

4 Improvements to a property are expected to increase its market value. In theory, at least, increased market values will result in a property reassessment so that the assessed value on which the tax is levied is also raised. Improvements can thus lead to higher property taxes.

5 When grants to school boards are removed, however, unconditional grants to municipalities account for an estimated 28 per cent of total grants in 1982-83.

6 In the 1970s, the province made a commitment (known as the Edmonton Commitment) to increase transfers to municipalities at the same rate as its own revenues grew. This practice was never implemented, however.

7 For further details, see Kwon (1979).

8 Gadsen and Schmenner (1977). This source also points out that piggybacking in the U.S. is more commonly linked to state sales taxes. Examples are provided by New York City and local governments in California, Illinois, and Mississippi.

9 There is a surtax on both in Manitoba.

10 Thirsk (1981) argues that the non-residential property tax is equivalent to a municipal profits tax.

11 Of course, much depends on the commuter's tax treatment in his home locality.

12 For a different view on locally determined rates, and local income taxes in general, see McMillan and Plain (1979).

13 The elasticity is, of course, reduced somewhat with indexing.

14 These formulas were chosen by Kitchen (1982) to reflect a system similar to the one in Manitoba.

15 Own source revenues exclude provincial grants; they include mainly property taxes, user charges, and other miscellaneous revenues.

16 On the other hand, municipal taxpayers may prefer also having an alternative tax source with an incidence clearly different from that of the property tax.

17 It can be assumed that the province is interested in equalization, since, under the current property tax system, the province provides a resource equalization grant based on assessment deficiency. As will be noted in the section, however, this grant has not been very successful at meeting the equalization objective.

18 There is no need for equalization to be tied only to income tax revenues. As will be noted below, ideally, an equalization program would equalize with respect to total fiscal capacity and need.

19 Other options are also available in the face of spillovers. For example, the province could take over the services entirely. This

would internalize to the province the externality to municipalities.

20 For example, if one-fifth of the total benefits spilled over into other municipalities, the matching rate would be 20 per cent: the province would pay 20 per cent of the expenditures and the municipality would pay 80 per cent.

21 Some evidence of the development of a 'fiscal gap' is provided in McMillan (1980).

22 It is not clear how this situation has developed. It could have been created, for example, because local governments have failed to alter their revenue sources (e.g., through greater use of property taxes and user charges) to keep up with their expenditure requirements. Alternatively, factors beyond their control may have created this situation.

23 This section is based, in part, on Musgrave (1961). The examples provided are for illustrative purposes and are not intended to be exhaustive.

24 This assumes that equalization is only with respect to income tax revenues. As will be noted below, revisions to the entire grant system may be appropriate. Thus, equalization would also include other revenue sources.

25 This assumption departs from much of the literature on grant formula design, which assumes different tax rates for municipalities. The whole issue of how the subsidy would affect fiscal effort (usually defined as the tax rate) does not apply here.

26 The amount taken from high tax areas just equals the amount transferred to low tax areas, since there is no cost to the province ($\Sigma S_i=0$, where S_i is the subsidy to jurisdiction i) except for administration.

27 This applies only to expenditures made out of the income tax revenues. The impact on total expenditures (and other taxes) is much less clear. See below.

28 This is roughly the formula used in Saskatchewan.

29 Note that E_i implies more than just expenditures made out of income tax revenues. If ET_i had been used, then k would have to be at least equal to 1, and this could not be a matching subsidy.

30 Current matching grants often have rates of 80 to 90 per cent which obviously reflects more than the spillover of services. See Slack (1981).

31 This section assumes a uniform income tax rather than a local option tax.

32 This is what happened in Manitoba. Given current government restraint, it seems unlikely that the province will provide additional revenues to municipalities.

33 See Slack (1981). Equalization factors are applied to the assessment figures for each municipality to take account of different assessments in different municipalities. However, even these are not up to date, so the grant is still inadequate.

34 The total fiscal burden would still be provincially determined, however, even if earmarked, and the province would lose a degree of freedom in its fiscal planning. In the same way that the provinces are currently affected by cyclical fluctuations or changes in federal rates, municipalities would be affected by cyclical fluctuation and change in provincial rates. It might be necessary to ensure that municipal revenues from the income tax surcharge will not fall below what they were in the previous year but it is not likely that these revenues would fall in any event.

REFERENCES

Bird, R.M., and N.E. Slack (1978) Residential Property Tax Relief in Ontario (Toronto: University of Toronto Press for the Ontario Economic Council)

Boadway, Robin (1980) Intergovernmental Transfers in Canada (Toronto: Canadian Tax Foundation)

Break, George (1980) Financing Government in a Federal System (Washington, D.C.: The Brookings Institution)

Breton, A., and A. Scott (1978) The Economic Constitution of Federal States (Toronto: University of Toronto Press)

Canadian Tax Foundation (1981) Provincial and Municipal Finances (Toronto)

Gadsen, C.H., and R.W. Schmenner (1977) 'Municipal income taxation.' In J. Meyer and J. Quigley, eds. Local Public Finance and the Fiscal Squeeze: A Case Study (Cambridge, Mass.: Ballinger Publishing Co.)

Gramlich, E. (1976) 'Intergovernmental grants: a review of the empirical literature.' Paper presented to the International Seminar on Public Economics, Berlin

Kitchen, Harry (1982) 'Municipal income taxation: a revenue alternative?' Canadian Tax Journal 30, 781-6

- (1984) Municipal Finance in Canada (Toronto: Canadian Tax Foundation)

Kwon, O. Yul (1979) 'Revenue sharing as an improvement in provincial-municipal relations in Canada: an evaluation of Saskatchewan revenue sharing.' Canadian Tax Journal 27, 576-87

McMillan, M., and L. Plain (1979) 'The reform of municipal-provincial fiscal relationships in the Province of Alberta.' Background study prepared for the Alberta Urban Municipalities Association, Edmonton

McMillan, Melville (1980) 'Local intergovernmental fiscal relations in Australia and Canada.' Occasional Paper No. 23, Centre for Research on Federal Financial Relations, The Australian National University, Canberra

Musgrave, Richard (1961) 'Approaches to a fiscal theory of political federalism.' In National Bureau of Economic Research, Public Finances: Need, Sources and Utilization (Princeton: Princeton University Press)

Rodgers, J.D. (1981) 'Sales taxes, income taxes and other revenues.' In J.R. Aronson and E. Schwartz, eds. Management Policies in Local Government Finance (Washington, D.C.: International City Management Association)

Schultze, C.L. (1974) 'Sorting out the social grant programs: an economist's criteria.' American Economic Review 64, 181-89

Slack, E. (1980a) 'The design of intergovernmental transfers.' Paper prepared for the Colombian Commission of Intergovernmental Finance

- (1980b) 'Local fiscal response to intergovernmental transfers.' Review of Economics and Statistics 62, 364-70

- (1981) 'Provincial-municipal grant reform in Ontario.' In J. Bossons, M. Denny, and E. Slack, Municipal Reform in Ontario (Toronto: Ontario Economic Council)

Thirsk, W.R. (1981) 'Political sensitivity versus economic sensibility: a tale of two property taxes.' In W.R. Thirsk and J. Whalley, eds. Tax Policy Options in the 1980's (Toronto: Canadian Tax Foundation)

Tiebout, C.M. (1956) 'The pure theory of local expenditures.' Journal of Political Economy 64, 416-24

Winer, S.L. (1979) 'Some evidence on the effect of the separation of spending and taxing decisions.' Discussion paper, Carleton University, Ottawa

Quebec's Experience with the Personal Income Tax

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INITIAL OBJECTIVES

The introduction by the Government of Quebec in 1954 of a personal income tax (PIT) directly collected by that province was a major and most spectacular development. However, in describing this event and in interpreting its significance, it is dangerous to be unduly influenced by the hindsight provided by later developments. In other words, we should resist the temptation to attribute to the Quebec government of the mid-1950s an ability to foresee the ultimate consequences of its decision. For instance, we can say today that Quebec nationalism was a factor in the events that led to the decision to set up the Quebec PIT. But words such as 'nationalism' cover very different realities over time; it should not be assumed that the Quebec nationalism of the 1950s was simply carried over into the 60s and 70s. There are more than simple differences of degree between the traditional ideology of national survival held by people such as Maurice Duplessis and the nationalism embodied in the program of the 'quiet revolution' and, to an even greater extent, in the program and policies of the Parti Québécois. More precision is therefore required.

The creation of a separate provincial PIT collection machinery in 1954 in Quebec and the abandonment of tax rental agreements that this move foreshadowed were the results of a struggle for power between Ottawa and Quebec. But power over what, precisely? A blanket reference to inter-

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I want to acknowledge assistance received from Ms. Gail Sinclair in drafting the third section of this paper. Thanks are also due to Richard M. Bird, Marcel Bélanger, Kenneth McRoberts, Gerard Bélanger, Conrad Black, and Robert Bourassa for their comments on a first draft. I tried to take account of all their suggestions for corrections and improvements, but I remain solely responsible for any and all remaining blemishes.

governmental power struggles is no more helpful than a general reference to nationalism. The nature of the struggle between Quebec and Ottawa in the mid-1950s was just as specific to that period and to the existing political forces as was the type of nationalism upheld by the provincial political leadership of the time. If we attempt to be more specific about the objectives of that struggle, we must come to the conclusion that it was not primarily power over financial resources per se that Duplessis sought. Indeed, in 1952, the 'generosity' of the federal tax offer to the various provinces was such that Quebec found itself isolated. If Quebec had only been after money, it would have followed the other provincial governments and accepted Ottawa's offer to renew the tax arrangements on its own terms.[1]

The connection between 'nationalism' and the Quebec PIT deserves closer examination. Although the purely constitutional case for 'taxing powers' being the main prop of provincial autonomy is intellectually unimpeachable, actual taxes as opposed to 'taxing powers' are not normally very popular and are therefore seldom treated as a political asset. Thus the Quebec government's use of a tax as a symbol of nationalism and its scoring of a political success in doing so has a flavour of paradox. What may perhaps account for this paradox is the fact that the Quebec government was not really trying to obtain more money for itself. Indeed, the net yield of the tax (after allowing for the administrative costs of collection) was less than the sum available as a grant from the federal government. Yet neither is it enough to say that the Quebec government only wanted a 'symbolic' victory. What was really at stake, in an implicit and oblique way, was not only the power to tax but also the power to spend for provincial purposes. By adopting its own autonomous PIT, Quebec was in effect challenging Ottawa's assumption of the right - based on its superior financial resources - to determine areas of provincial jurisdiction where the 'national interest' required that more be spent (such as for higher education, the Trans-Canada Highway, etc.), something the provinces could hardly envisage doing on their own while they were kept on a tight financial leash by Ottawa. The success of that argument hardly depended on whether the provincial government actually increased its spending into those areas or not; indeed, it probably helped with a large segment of Quebec public opinion that everybody knew that it would not.

In the 1952 provincial election campaign, Duplessis had been quite explicit in his rejection of the income tax on individual incomes as a source

of revenue for financing provincial expenditures. A provincial PIT had last been introduced by the Liberal government of Quebec after the 1939 election which had thrown Duplessis out of office: he was not, if he could help it, going to be the one to bring it back. Duplessis was a most conservative politician, and he held deep convictions against increasing the role of the state and against the blunting of incentives that is inescapable with any form of taxation. To the extent that a provincial PIT was a symbol, it would serve less as a symbol of fiscal autonomy of Quebec in the field of taxation than as a symbol of the autonomy of the province in the field of public expenditure. More specifically, Duplessis wanted to assert provincial autonomy in order to block or at least to undermine the federal government's extremely wide interpretation of its spending power - an interpretation that included fields of provincial jurisdiction and spending for provincial purposes.

Duplessis was at pains to stress the constitutional division of legislative powers as a guide that should be used by governments in dividing taxing powers. He saw a very close correlation between legislative authority on the one hand, and taxation and spending on the other. The federal government strenuously denied any such correlation.[2]

Support from traditional nationalist circles for Duplessis' stand was rooted in the perception - which Duplessis shared - of a link between federal grants to universities (the other burning issue of the day) and the tax sharing issue.[3] Therefore Duplessis set himself the goal of obtaining the power to tax personal incomes separately from Ottawa - political terms, especially for him, a rather thankless undertaking - not because he wanted to use this victory and this power. Rather, he wanted to sterilize, as it were, a part of the country's fiscal capacity and to slow down the growth of the government's role. This may explain why, after his fiscal victory over Saint-Laurent, he forbade Quebec universities to touch any of the federal grants offered them and kept higher education in Quebec on a starvation diet.

A government more inclined to spend might have preferred larger cash payments from Ottawa to the acquisition of a power to tax. Duplessis' concerns were quite different.[4] He was an arch-conservative ruling an ultra-conservative society. This implies no derogatory judgment of either; Duplessis was after all the leader of what was in effect the province's conservative party. Some authors (for instance, Roy 1976) have rightly pointed out that Quebec was far from monolithic during these

years: In the labour unions, in the universities, and in the media, many people had non-conformist, liberal views. Yet in my opinion the epithet 'ultra-conservative' is as valid in this context as it can ever be when it is applied to a whole society. Quebec was not monolithic, but neither was it pluralistic. Evidence for this view can be found in the - to our eyes - ridiculous lengths to which people would go to placate established views when expressing dissent. Non-conformity tended to be equated with subversion.

To make full use of the power to impose a PIT at a rate set independently of Ottawa's fiscal policy was inconsistent with Duplessis' beliefs. He claimed the power and eventually won it, but he had no intention of making more use of it than was necessary to justify his fight for it. To do otherwise would be to bring about changes that he did not want. He was not about to usurp the role of the Catholic Church in running educational institutions, to usher in 'socialism' in the guise of hospital insurance, or even to challenge the traditional role of the federal government with an aggressive 'revisionist' policy.

In 1953, following a recommendation of the Quebec Chamber of Commerce, the province set up a commission of enquiry into constitutional problems, particularly the related issues of provincial autonomy and tax sharing. Among the recommendations of the commission, which was chaired by Judge Thomas Tremblay, was the idea of claiming for Quebec complete and exclusive control of all direct taxes. Duplessis had set up the Tremblay Commission to help him against the Ottawa leviathan: it opened the door to such an extension of the provincial government's role that he kept its report under wraps.[5]

Partisan considerations were not and could not be entirely foreign to Duplessis' decision to make a fight of the income tax issue. The Union Nationale had been born in 1935 out of an alliance between the Quebec Conservative Party and the dissident Action Libérale Nationale, a splinter group from the Quebec Liberal Party made up of very vocal nationalists. To continue to command the loyalty of many of its supporters, Duplessis had - on perhaps only a few well-chosen issues - to strike a nationalist posture. The original wartime tax rental agreement with Ottawa had been increasingly resented by nationalist groups in Quebec; its reconfirmation in peacetime added, as it were, insult to injury, for it was seen as a de facto surrender of provincial rights over direct taxation.[6] The constitutional authority to levy direct taxes was regarded as the foremost symbol of

sovereignty at the provincial level; a province's right to levy such taxes was the indispensable tool of its much-valued non-subordination to the central government. These views were common currency in nationalist circles and provided the backdrop for Duplessis' uncompromising stance. Yet while there is no reason to doubt his sincerity, it is unfair to portray him as an unbending doctrinaire. On some issues, such as the 1951 constitutional amendment to allow Ottawa to take responsibility for old age pensions, he showed that he could adapt his principles to political expediency. Duplessis also displayed flexibility about autonomist principles when he agreed in 1954 to drop from the Quebec PIT legislation words in the preamble that reiterated his claim to a provincial 'right of priority' in the fields of direct taxation. His remarks in the Legislative Assembly justifying this change implied that this claim was just 'words', ignoring the fact that he had placed much emphasis on these words.

Duplessis had another and possibly just as relevant reason for pursuing the course he did. The Union Nationale was interested in painting its political opponent, the Liberal Party of Quebec, as a mass of disloyal collaborators with the central government. After all, it had been the Liberal premier, Adélard Godbout, who in 1940 had been party to the original tax rental agreement, and there was some partisan mileage to be gained from undoing what Godbout had wrought.

Finally, why did this confrontation between Quebec and Ottawa over PIT happen when it did? After all, the objectives outlined above had a timeless dimension. Were they not just as valid in 1946 as they were in 1953? Indeed, Duplessis' position was consistently maintained over the whole period; in fact, the initiative came mainly not from Duplessis but from Ottawa. Side by side with Ottawa's uninterrupted attempt to retain total control over direct taxation in the post-war period was a major offensive on the expenditure side to assume control in the most important field of provincial jurisdiction - education. Confronted by the prospect of provincial elections in 1952, Duplessis bought time and appeared to vascillate; but once the electoral hurdle was overcome, he counter-attacked on all fronts. First, he refused to continue into 1953 the acceptance of federal university grants. In 1953 came the setting-up of the Tremblay Commission, and in January 1954 the bill setting up the PIT was introduced. The federal tactic of isolating Quebec, used in the 1952 renewal negotiations, together with the massive federal escalation on the expenditure side, left Quebec with no alternative but to fight or concede defeat

on all fronts. With the election behind him, Duplessis was now in his fourth term in office and in his mid-sixties. He had nothing to lose. His uncompromising positions on taxing and spending powers, reaffirmed through the 1952 campaign, left him with no tactical room to manoeuvre in any case.

EXTENT OF REALIZATION OF INITIAL OBJECTIVES AND UNANTICIPATED CONSEQUENCES

Before going on to discuss the extent to which the Quebec government succeeded in attaining its initial objectives, it is appropriate to ask what made success possible. Against the desire of the federal government, Quebec set out to:

- establish its own PIT, including its own collection machinery;
- obtain a widening of deductibility rules under the federal PIT for the provincial tax.

It was successful on both counts - an unlikely outcome that surprised observers and participants alike. The following factors appear to have contributed to that success:

- Quebec based its case on a rigorous reading of the constitution, and it held firmly to that interpretation over many years. Hence, the Quebec government was not vulnerable to charges of inconsistency. Quebec was not attempting to change the constitution to its own benefit, its interpretation was not stretched, and it carefully avoided any extension that might smack of extremism.

- The federal government's position was fraught with contradictions. The federal government had acquired control over direct taxes on a temporary basis for wartime purposes, but it sought to make that situation permanent in peacetime. By 1953, which marked the end of the Korean War, even the rhetoric of the cold war was wearing thin as a justification for the federal government's position. By offering money to universities, the federal government acknowledged the existence of financial need in areas of provincial jurisdiction, but it was unbending in its sharing arrangements, allowing provinces that might choose to levy a PIT only the

benefit of a meagre 5 per cent deductibility against the federal tax. It paid lip service to provincial rights in the field of direct taxation but insisted on rigid uniformity in its arrangements with the provinces.

- Opposition to the Quebec position both federally and provincially discredited itself by side-stepping the issue and attempting to paint Duplessis as an extremist (or even a separatist). Since he was anything but that, the argument misfired.

- As indicated above, Duplessis' 1952 election victory over the Quebec Liberals' background of mounting conflict with the Liberal government in Ottawa gave him an important advantage. This advantage could not be compensated for by the federal election of 1953, which was, as is so often the case in Quebec, a foregone conclusion.

- For some or all of the foregoing reasons, public opinion strongly supported the provincial government. Nationalist support was obvious and vocal. However, that support was not limited to the rather narrow circles traditionally identified with nationalism, such as the Action Nationale, the Saint Jean Baptiste Society, and Le Devoir, but extended even to the Montreal and provincial chambers of commerce. Even a strict constitutionalist of very different persuasion, Pierre E. Trudeau, joined forces with the nationalists on the issue of university grants.[7] However, the most revealing demonstration of public support was found in the public hearings of the Tremblay Commission. It has been said that it was through those hearings that Duplessis discovered the opportunity to press ahead with the plan for a provincial PIT (Durocher and Jean 1971, 346-48).

Granting that Duplessis won the confrontation, to what extent were the objectives he pursued attained? Although his political triumph was total, in technical-fiscal terms his victory was less than complete. Although the provincial tax was set at 15 per cent of the federal tax, Ottawa only increased the amount it allowed to be deducted from the federal PIT for taxpayers also paying PIT to a provincial government from 5 to 10 per cent.[8] It is unclear whether the more generous personal exemption granted under the provincial PIT ($1,500 instead of $1,000) was meant to bring the yield of the provincial tax to 10 per cent of the federal tax and so qualify it for total deductibility or whether it corresponded to a desire to

minimize the number of taxpayers who would have to file two tax returns. In any case, for those taxpayers filing two returns, double taxation was not entirely avoided.

On partisan grounds, the PIT challenge was a complete success. In the debate about the PIT double taxation threat, Duplessis was skillful or lucky enough to manoeuvre his Liberal opposition in Quebec into the position he probably wanted it to adopt. Bolstered by private assurances from the federal finance minister that Ottawa would never yield to Duplessis' demands, the provincial Liberals opposed the provincial government's effort to 'win back' its PIT powers.[9] In the event, however, the federal government backed down under the threat of double taxation and unfavourable opinion and left the Quebec Liberal opposition high and dry. Duplessis succeeded in making it appear even less willing than the federal government to accept the validity of Quebec's claims to fiscal autonomy. Largely for this reason, the Liberal Party was soundly beaten again in the 1956 general election.[10]

The provincial effort to stem the federal government's centralizing drive did not immediately succeed. Ottawa continued its offer of university grants. Bolstered by its success on the tax side, the Quebec government proceeded, in effect, to forbid their acceptance by Quebec universities. Undeterred, Ottawa allowed the grants intended for Quebec universities to accumulate in a trust fund, thus building up the pressure. It was left to Duplessis' successors to end the impasse.

In a broader sense, however, the conclusion to this Quebec-Ottawa confrontation can be said to constitute a watershed in the country's constitutional evolution and certainly in the history of federal-provincial financial arrangements. In the years before 1954, Ottawa made a long series of important decisions that brought about spending programs entirely financed, regulated, and administered by the federal government in areas of provincial jurisdiction. These programs were unemployment insurance, family allowances, and old age pensions. Two of the programs required constitutional amendments to which Quebec (in one case under Duplessis) consented. After 1954 came even more significant spending programs on federal initiative: hospital insurance, medicare, and social assistance. All of these later programs were to be cost-shared with the provinces, but provinicially administered. It is, of course, a matter of speculation whether they would have been introduced as cost-shared programs, rather than as completely federal programs, had the philosophy behind the tax

rental agreements not been successfully overturned. In the case of Quebec, however, even the measure of recognition of provincial rights implicit in cost-sharing was not enough. The opting-out arrangements of 1964 were, in a sense, the logical consequence of the 1954 battle. The Established Programs Financing Act of 1977 helped to generalize to all provinces the situation created by the opting-out arrangements of 1964 and, in a sense, represents today the ultimate consequence of Quebec's early success in the field of personal income taxation.

However, if one looks at those events in the light of the nationalist-regionalist objectives that were so powerfully strengthened by the 1954 struggle, it could be argued that the success achieved was more symbolic than real. The 1964 opting-out arrangements, as well as the 1977 EPF arrangements, retain provisions for cash transfers to the provinces and therefore detract from a pure 'autonomist' or provincial rights model. The hope nurtured in nationalist circles that the 1954 victory signalled the eventual rollback of Ottawa's presence in taxation fields was never realized. The Union Nationale campaigned in 1966 with a slogan inspired by the Tremblay Commission's recommendation of full provincial occupancy of all direct tax fields. Once in office, it had to quickly forget about that slogan.

To sum up, the 1954 PIT act adopted by Quebec was a masterful political stroke. Its long-term influence on the evolution of federal-provincial financial relations should not be underestimated, since it fully reasserted the principle that each province could adopt vis-à-vis personal income taxation whatever policy it deemed appropriate with respect to both tax rates and the structure of the tax. However, because the real focus of the power struggle was on the expenditure side, the full advantage of the provincial victory could only be exploited by a government that was inclined to outspend its 'competitor'. Duplessis' government was not so inclined, and the strategic advantage gained in 1954 was not exploited until 1960. However, the ambitious goal of full provincial fiscal autonomy was achieved neither in 1954 nor in the 1960s. Indeed, it remains elusive to this day.

Quebec's 1954 victory over Ottawa established for the provinces - to the extent that they were willing to absorb the cost of setting up their own tax collection machinery - full fiscal autonomy on the tax side. However, although it somewhat constrained Ottawa's use of its spending power it did not abolish it in the sense of making it coextensive with its legis-

lative authority. Consequently, provincial fiscal autonomy on the expenditure side remains incomplete and conditional.

QUEBEC'S ACTUAL USE OF ITS CONTROL OVER THE PIT[11]

Although Quebec has been able to do whatever it wants regarding both tax structure and tax rates in relation to its self-administered PIT, it has been impossible to predict exactly what balance will be struck from time to time between divergent considerations. On the one hand, prudent fiscal management (i.e., concern not to produce tax differentials between Quebec and other provinces that might be injurious to Quebec's economy and/or that would make compliance by taxpayers to two PIT tax laws unduly burdensome) will tend to limit the extent to which this power is used to produce Quebec PIT rules different from the federal ones. On the other hand, the special characteristics and needs of the province, as well as various policy objectives thrown up by the provincial political process, tend to increase over time the discrepancy between the federal and the provincial PITs. It is to be expected that this balance, whatever it may be at any given moment, will not be constant over time.

Tax harmonization

A general observation must be made about legal parallelism between any federal and provincial statutes. This is a feature found in any federal system whenever the two levels of government happen to legislate on the same topic. It is to be observed, for instance, in the fields of labour law and company law. One of the laws - generally the federal statute - has been enacted before the other and has served as a model for it, since consistency is a prized characteristic of legal rules. Even after many years and several unrelated amendments on the two 'sides', legislative inertia ensures that a wide area of similarity remains. Basic concepts - especially as embedded in case law - are bound to continue basically unaltered for a very long time indeed. This parallelism does not of course have very much to do with 'harmonization': it is simply a feature of law-making in federal countries.

Better evidence of harmonization as an effective policy goal would be the existence of amendments to law A that were introduced to match amendments made to law B after law A was enacted. Now, harmonization

(or words to the same effect) is like motherhood: there is no lack of well-meaning declarations by legislators that can be quoted in its support. Harmonization efforts, however, are quite something else.

In 1965, the Quebec Commission of Inquiry into taxation (the 'Bélanger Commission') observed that

> the Quebec income tax act enacted in 1954 was modelled after the federal income tax, as it stood on 1 January 1954. ... However, the text of the Quebec act saw its references to given sections of the federal act, as amended since 1954, only adjusted in 1960. The Quebec act was thereafter brought up to date on 1 January 1963 and 1 January 1965 so as to accord with the federal act.[12]

The Commission thereupon suggested that references to specific sections of the federal act as they stand at a certain date be replaced by references to corresponding sections of the federal act 'as they stand for the same fiscal year, with the proviso that regulations by order in council can prevent the automatic parallelism from prevailing.' Not much was done with this recommendation until 1972, when a new Quebec tax law was brought in that adopted an entirely different approach.

The Taxation Act of 1972 incorporated into one piece of legislation the Income Tax Act, the Corporation Tax Act, and the Logging Tax Act. This was done for the sake of convenience and efficiency, with the long-term objective of eventually drafting one single revenue code. In order to make the provincial act an autonomous piece of legislation, all references to the federal act were weeded out. Instead of following the federal structure, the Taxation Act was given one of its own. For example, definitions and rules of interpretation were put at the beginning of the act instead of at the end. Also, the divisions were set out differently, so that the provisions could be more clearly outlined. Consequently, the Taxation Act contained 934 sections, as opposed to the federal total of 260. Cross-referencing between the two acts was difficult, but the objective of having the Quebec Act stand on its own was met. In tabling this piece of legislation, the minister of revenue said:

> I would like to add, finally, that the bill presented to this legislature is complete in itself and makes no reference to any other income tax act. Moreover, it has been drafted from scratch in French and in the legislative drafting style used for all other pieces of legislation by the Government of Quebec. This will probably meet with the approval of several members of this House who were annoyed at our borrowing from the federal act many of its dispositions.[13]

In this instance, we see that the so-called goal of harmonization can easily give way not only to higher order goals having to do with questions of substance but also to matters of form. The initial impact of this change in drafting style may not have been dramatic, but with judicial interpretation the impact is bound to grow over time. Probably it was also felt that legislation by reference to the federal statute as the latter evolved was tantamount to a renunciation of sovereignty and meant undoing the achievement of 1954.

The point made here should not be misunderstood. To say that harmonization efforts do not rank high on any provincial government's scale of priorities and are therefore fitful and sometimes long-delayed does not necessarily mean that the Quebec and federal income taxes have become incompatible or even very different. Much of the initial parallelism remains even after 30 years. Economic realities have exerted a real, if unmeasurable, restraint on fiscal policy initiatives in Quebec, and, as will be explained further on, there have been some harmonizing changes in PIT features by both levels of government. Nevertheless, a trend toward increasing divergence does seem to exist.

Substantive and purposeful gaps

Most of the differences between the Quebec and the federal PITs presumably reflect policy goals of a higher order than harmonization itself. Interestingly, threats have sometimes been made that the province would 'have to' strike out on its own and diverge from federal tax policy. For instance, during his budget address of 5 April 1963, Premier Lesage made the following statement:

> Twelve months will go by before the next budget speech. Whatever party is elected on April 8, and I repeat whatever party is elected on April 8, the central government will have to make use of those twelve months to make allowance for Quebec's needs or else we in Quebec will have to take steps on our own side to make the required decisions in fiscal policy. And the decisions will be those imposed on us by the aims of economic, social, and cultural affirmation we have set ourselves at the request of the people of Quebec.

This statement, made when Quebec was pressuring the federal government for a greater share of its revenues and Ottawa was not being very accommodating, sounded like an ultimatum. The federal government reacted by agreeing to give Quebec an increased share of its revenues.

Hence, although Quebec made no changes to its act, by threatening to do so and thereby reviving the spectre of double taxation it made an effective use of the fact that it already had its own PIT system in place.

At another time, a similar threat was made not to obtain greater deductibility of the provincial from the federal tax but to secure some changes in tax structure provisions of the federal tax.

In 1971, Quebec questioned several of the major tax reform measures proposed by the federal government in the Benson White Paper, objecting in particular to the proposed integration of corporate profits tax into the personal income tax. Concerned about the administrative and economic difficulties this step would create, the province urged Ottawa to reconsider. In the 1971 budget address, Quebec's government policy with regard to tax harmony was clearly stated:

> One of the features of the Canadian taxation system is its high degree of uniformity throughout the country, even for taxes levied by the provinces themselves. Quebec feels it is advisable to have agreement, unless there are special reasons, in the tax base definitions adopted by various jurisdictions. There is serious danger that the opposite may become the general rule if the federal government adopts the proposed integration system. Quebec - and even Ontario, which let it be understood that it would collect its own personal income tax if the tax reform took place according to the White Paper - could very well have no choice but to keep the existing system of dividend credit, while improving it.
>
> We therefore strongly urge the federal government to revise its position while there is still time, rather than instigate fiscal anarchy through changes unwanted by other jurisdictions.

Accordingly, compromises were worked out, and in December 1971 the minister of finance, Mr. Garneau, announced that Quebec would accept the federal tax reform as amended in principle and incorporate the changes into its own act. These threats and the federal reactions to them suggest that the Quebec government has seen tax harmonization primarily as a matter of more interest to the federal government than to itself - a perception that the federal government appears to have shared.

With respect to the White Paper proposals, it is of course possible to argue that the provincial governments were just as committed to harmonization as was the federal government, but that both levels realized that harmonization was not a sufficient reason for the provinces to agree to an otherwise highly controversial innovation in fiscal policy. Thus the threatened provincial dissidence was a convenient excuse for Ottawa to quietly abandon integration without necessarily being the most important reason

for that change of heart.

Differences between the federal and Quebec PITs resulting from purposeful decisions of the Quebec government have been accumulating from the start. As has already been mentioned, the personal exemptions under the Quebec PIT were set higher than the federal ones ($1,500 vs. $1,000). When the differential was removed in 1960, this was clearly done not in order to harmonize the two taxes but because of provincial revenue requirements (in effect, to help finance the provincial share of hospital insurance).

In 1973, the Quebec government announced a major divergence from the federal act: it had decided not to follow Ottawa's 1972 lead with regard to indexing. The justification invoked was that the move was too costly and that superior equity could be achieved by selective rate reductions aimed at lower-income taxpayers. To this day no Quebec government has accepted the principle of automatic full indexing of the PIT. From time to time, discretionary changes have been made in exemption levels and tax rates in various brackets, but inflation has been only one of a number of factors accounting for these changes. For instance, in April 1978, personal exemptions were raised from $1,600 to $3,600 for single individuals and from $2,400 to $2,700 for married persons. In January 1980, a system of 'partial indexation' was inaugurated. However, the rate is a discretionary one set annually by the government. In order for this measure not to appear as too obviously a public relations exercise, the rate had to be different from a rate that would exactly offset inflation. For revenue reasons, it has always conveniently turned out to be much lower.

The policy-motivated gaps between the provincial and federal PITs include a whole series of divergences that perhaps could be claimed to reflect, in some way, more or less permanent social preferences that transcend political parties. These divergences have to do with the tax treatment of the family.

In 1967, Quebec complemented the federal family allowance scheme with its own system of family allowances on a progressive scale, graduated according to the number, order, and ages of children in the family. At the same time, a divergence from the federal act was introduced: there would no longer be exemptions for dependent children under the age of 16. In the early 70s, the issue of family allowances became the subject of heated debate between the Quebec and federal governments. The negotia-

tions eventually led to an agreement whereby provincial variations in the federal allowances would be permitted for the first time. As part of the agreement, the Quebec government decided that it would not tax (either its own or federal) family allowance payments. The federal government had previously agreed not to tax provincial family allowances provided the province would not tax the federal allowances. The rationale for this provincial policy was that for reasons of vertical equity family allowances had been substituted for child exemptions in 1967 and that for reasons of both horizontal and vertical equity the new system should be exempt from tax.[14] In the same spirit, when Quebec introduced a deductibility provision for child care expenses, it set the limit 50 per cent higher than the federal one. In the 1980-81 budget, it quickly seized upon a measure originally introduced in the December 1979 federal Conservative budget (but not implemented at that time) with respect to the sharing with a spouse of the income from an unincorporated business. The Quebec PIT allows for the deduction as an expense of the remuneration paid to a spouse or, alternatively, for the spouse's sharing in the income as a partner.

In addition to divergences of a relatively permanent nature reflecting perhaps profound social preferences, there have arisen purposeful divergences designed to project and implement the political commitments of the party holding office at the time.

When the Parti Québécois came into office in 1976, it was anxious to convey an image of social democracy, which can perhaps be translated in fiscal terms as favouring a more progressively distributed tax burden. It was also concerned about channelling domestic savings into capital investment within the province. As was previously described, it refrained from introducing indexation of the PIT for much the same reasons as the preceding government. However, because of the lack of indexation and because of 'progressive' changes in tax rates in the 1978 budget, the tax rates in the province, combined with the federal rates, made Quebec taxpayers earning $15,000 or more the most highly taxed individuals in Canada. Already, in the previous year, the Quebec government had lowered the maximum employee contribution to a Registered Retirement Savings Plan to $3,500 in cases in which the employer contributed on the employee's behalf to a deferred profit sharing plan (in contrast, the federal limit is $5,500 across the board). Complaints from professionals and executives about their fiscal positions became so acute that in the 1979

budget the government introduced what has come to be known as the 'Parizeau plan'. This measure allows Quebec residents to deduct up to $15,000 in computing their taxable income for Quebec purposes in respect to stocks purchased in Quebec companies that are eligible under the plan. The deduction is limited to either $15,000 or 20 per cent of earned income, minus the taxpayer's deductible contributions in the year to his RPP, RRSP, and RHOSP. The company offering the stock must have its head office in Quebec; alternatively, during the taxation year ending before the date of the company's last prospectus, the company must have paid more than 50 per cent of its salaries and wages to employees employed in a place of business situated in Quebec. The shares themselves must be new common shares, with voting rights, bought on the primary market.

This measure, introduced as a special incentive for investment in small Quebec companies, as was clearly stated in the 1979-80 budget address, was meant to defuse a 'revolt of the rich' that was triggered by the previous year's income redistribution reform. The government hoped that the scheme would pacify those who were complaining that the reforms were driving corporate executives out of the province.

From coordination to competition

From 1967 to 1972, there were almost continuous federal-provincial consultations on tax reform at both the ministerial and official levels. These were the years in which Canadian governments had to react to the Carter Commission report and decide on tax reforms. Most changes in the federal and Quebec PIT acts were made in parallel, with the major exception of indexation.

However, since then and especially since the change of government in Quebec in 1976, there appear to have been an increasing number of instances in which a common realization of a tax avoidance problem has led to divergent responses. Until a few years ago, purposeful divergences (as opposed to 'nuisance gaps' resulting from inertia and delays in making parallel amendments) appeared always to have been motivated by differences in policy objectives. More recently, similar or even identical policy objectives have led to technical divergences in the means used to correct those problems: these cases represent instances in which the extra cost of taxpayers' compliance cannot be offset by the 'benefits' derived from the achievements by each government of preferred objectives. Several of

the divergences in question are discussed below.

In December 1977, the minister of finance, Jacques Parizeau, announced several major changes in the Quebec Taxation Act relative to the federal act. It was made clear that the new government would not be following a strict policy of tax harmonization. Major departures were announced with regard to (1) Registered Homeowners' Savings Plans, (2) the $1,000 interest deduction, (3) the federal stock option plan in private Canadian corporations, and (4) employee loans.

1 Both the federal and Quebec governments had been concerned about potential abuses of amounts invested in Registered Homeowners' Savings Plans. However, each adopted a different solution to one of the perceived problems.

The governments were concerned about the possibility of a taxpayer's use of the funds to purchase the owner-occupied home of his spouse. The federal government closed off this possibility by adopting an amendment that prevents a taxpayer from deducting future contributions to an RHOSP if his spouse owns an owner-occupied home. In contrast, Quebec adopted the more restrictive measure of providing that there would be tax consequences if a taxpayer used the funds to acquire his home from his spouse as of 12 April 1977.

It is not self-evident why Quebec adopted this amendment. However, with regard to other federal reforms dealing with RHOSPs, Quebec announced that it would follow the federal lead.

2 Both governments were also concerned about potential abuses of the $1,000 interest deduction that had been introduced by the federal government in 1974 and adopted in Quebec. It was feared that taxpayers would use the provision not, as intended, to compensate them for the effect of inflation on investment income, but to artificially avoid taxes by borrowing money for that purpose alone. Ottawa responded by introducing a limitation rule, whereas Quebec introduced a netting-out provision. Hence, the rules in this regard are different.

Furthermore, Ottawa decided to include capital gains in the $1,000 interest and dividend exemption, whereas Quebec declined to do so. Also, the Quebec government completely eliminated the deduction for taxpayers whose business income exceeds 25 per cent of their total income. It is not clear why these departures from the federal provisions were adopted.

3 The most noteworthy of the gaps created in 1977 resulted from Quebec's failure to follow Ottawa's lead and exempt employee's stock option benefits from tax at the time of exercise. The federal measure was designed to encourage investment by employees in private Canadian-controlled corporations. It is not at all clear why Quebec decided against adopting this measure.

4 The federal government adopted a measure whereby free or low-interest loans by employers to employees were to be included in income. Quebec announced that it would enact a similar rule to come into effect a year earlier, but it would not adopt the federal exceptions to the rule - that is, the exemption of a housing loan up to $50,000 and the exclusion of the first $500 from employee benefits. Again it is not clear why Quebec did not adopt these exemptions.

In April 1978, Quebec introduced numerous changes with regard to automobile expenses. Specifically, an individual using a car for both business and personal uses would not be able to deduct the cost of licence plates and insurance premiums, a driver's permit, and parking. In addition, the minimum operating costs for personal use were deemed to be $75 per month. Also, limits were placed on the capital cost allowance. No similar federal restrictions were introduced at that time. With regard to automobile standby charges that employees must include in income, the province set the minimum of 2 per cent per month of the capital cost of the vehicle or, alternatively, two-thirds of the rental cost. In contrast, the federal provisions set a minimum of 1 per cent of the capital cost or one-third of the rental cost. It seems clear that these changes were introduced in order to increase revenue.

In 1979, other measures were introduced that were at variance with the federal PIT:

- The maximum deduction for 1979 and subsequent taxation years for contributions to Registered Retirement Plans for individuals and employers was increased to $5,500 from $3,500 for both current and past service contributions (the federal limit is $3,500).

- Individuals having a business income of more than 25 per cent of total income were entitled as of 1979 to the $1,000 exemption for dividends and interest denied in 1978.

In the 1980 budget, Quebec introduced a measure regarding the taxation of low interest loans to employees, whereby the benefit would be calculated differently depending on when the loan was made. For example, if the loan was made after 1973, the benefit would be calculated by reference to an annual rate of 8 per cent, whereas if it was made after 1980, the rate of reference would be 11 per cent. This equitable measure has not yet been adopted by the federal government.

In all the above instances, differences between the technical solutions worked out by the Quebec and by the federal tax authorities do not necessarily derive their significance from the assumption that such disparities will be permanent. Indeed, there are several suggestions that Ottawa has been seriously considering imitating some of Quebec's innovations. On the other hand, these discrepancies have nothing to do with the leads and lags also observed in tax administration, where one of the taxing authorities precedes the other in the recognition of a tax avoidance problem and in implementing a remedy. What is significant is that both tax authorities appear to recognize a problem more or less simultaneously, and that both, also at roughly the same time, implement different remedies. Instead of a collaborative approach, which would entail consultation and parallel implementation of the same remedy, the two tax authorities seem to have engaged in competition.

Perhaps in part because he sensed that these cumulative divergences were beginning to prove a major problem for tax compliance, and perhaps also because the 12 November 1981 federal budget appeared to move in the directions that Quebec had already chosen for itself, the Quebec finance minister made this statement in his May 1982 budget speech:

> On the whole, however, we are attempting, fairly successfully, to avoid any appearance of a tax jungle for which the taxpayers would have to pick up the tab.
>
> Because of the delay in the tabling of the federal legislation, I am taking advantage of the budget speech to announce that Quebec's tax laws and regulations will be amended to better align federal and Quebec tax bases, and that these concordance measures will be applicable on the same dates as they are for the federal income tax purposes.

Whatever the merits or demerits of the 12 November 1981 federal budget and the Quebec tax policy moves of the last few years, this 'follow the leader' approach to tax harmonization is surely not ideal from the taxpayers' viewpoint. It almost guarantees that there will always be some divergence, although specific divergences may be temporary. Admittedly,

the problem is no more or less severe when the provincial government leads than it is when it follows: it only shows where at any one time the most fertile fiscal creativity (?) is to be found.

It can perhaps be argued that provincial initiatives of the kind that Quebec has undertaken in the last few years provide a useful test for new and untried tax innovations, which, if successful, may later be introduced in other jurisdictions. Restricting such 'experiments' to one province at a time certainly has some advantages for both Canadian taxpayers and Canadian governments.

POLICY IMPLICATIONS OF THE QUEBEC EXPERIENCE WITH THE PIT

Policy implications of the process that led Quebec to set up its own PIT

1 Constitutional doctrine was of no help to Quebec in setting up its own PIT. Although the province had constitutional law on its side in its dispute with Ottawa over taxing powers, it could not make effective use of this doctrinal advantage. First of all, the right of any province to levy a PIT was never denied by Ottawa. Indeed, the very existence of tax rental agreements since 1940 was evidence of this recognition in principle of the province's right to levy a PIT, among other taxes.

Although no one attempted to argue that the provinces had no right to levy direct taxes, the thrust of the Rowell-Sirois report and of the policies pursued by Ottawa civil servants and politicians was that it was inconvenient and inappropriate for the provinces to make use of that right. There was fear that Canada would become a tax jungle, that Ottawa would be handicapped in the pursuit of newly fashionable Keynesian aggregate demand management through fiscal policy, etc. In addition, the federal government managed to make the use of that right by the less well-off provinces unprofitable by including in the tax rental payments an element of implicit equalization. Although it did not challenge provincial rights directly, Ottawa wanted to make the use of these rights in direct taxation fields obsolete. To Quebec nationalists, this was a fine distinction that was and remains most often lost.

However, there was also a fine distinction on the Quebec side of the argument. The point of the 1959 dispute with Ottawa was not that Quebec wanted to exercise its right over the PIT in spite of Ottawa's objections. What Quebec wanted was not to levy a PIT fully independent of the federal

PIT, but to obtain a reduction in the PIT yield of the federal government equivalent to the proceeds of the province's own PIT.

Quebec could have begun to levy a PIT in 1947 when it introduced a corporate profit tax. It needed no agreement with Ottawa to do so. What it wanted was to levy a PIT without imposing any additional burden on Quebec taxpayers - that is, wholly at the federal treasury's expense. This was of course the point of the argument that Quebec (and all other provinces) had a 'priority right' to direct taxes. However, this argument could not be based on the constitution. Its only basis was an interpretation of Canada's fiscal history - and a somewhat shaky interpretation at that. As we have seen, Duplessis quickly dropped the argument and it seems never to have been taken seriously since. In the campaign to obtain this rollback of the federal tax, the constitution was of no use. This did not necessarily have to be the case. One can speculate that, had Canada's Supreme Court followed the American tradition of creative legal interpretation, it might have been possible for Quebec to contemplate a judicial settlement: if a province had a constitutional right to tax, it also had a right to exercise that power without inflicting on its citizens de facto discrimination by refusing to 'rent' the use of that power to the federal government without a compensating reduction of the federal tax bite in that province equivalent to the transfers to other provinces for the exclusive federal use of this particular tax. However, it was well known that the Canadian Supreme Court has always had a more restrained vision of its role than its American counterpart and that the possibility of court action was moot.[15]

2 A major new tax can be introduced with success (i.e., be accepted as legitimate, however grudgingly) only if public opinion also strongly supports public expenditures that are thought to be closely linked with the new tax. Although the Quebec government consistently maintained its position of unequivocal opposition to exclusive federal occupation of the direct taxation field from 1945 onwards, it made absolutely no progress for several years. Not only were the federal-provincial fiscal arrangements initiated in wartime renewed in 1947, but the negotiations leading up to the 1952 arrangements saw Quebec's objections ignored by Ottawa. At the end of the process, Quebec found itself totally isolated.

However, as soon as the federal government extended its centralizing offensive from the tax side to the expenditure side, things began to

change. With the Massey Commission and federal grants to universities, Ottawa began to play a role in a field of unambiguous provincial concern. In other words, it became clear that Ottawa's exclusive use of some taxing powers was in part explained by its decision to spend money for provincial purposes. Not only was its refusal to share tax powers henceforth deprived of its justification, but the spending area in question was both one that made the federal presence in Quebec very hard to justify and one that attracted considerable, even passionate, interest.

Had the federal government continued in the early 1950s to spend only for its own purposes, the provincial PIT would probably never have seen the light of day, since it was by no means likely that the Quebec government could have obtained an offset for its tax from the federal government beyond the 5 per cent that was already on offer - 'a feature which was the federal government's way of convincing the provinces that they were agreeing rather than submitting' (Moore, Perry, and Beach 1966, 45).

For those reasons, it is probably not inaccurate to describe the Quebec PIT as an unexpected and unwanted consequence of the Massey Commission's efforts to define and defend the Canadian culture. At any rate, it should be clear that the Quebec PIT was a defensive reaction to the federal initiative and not a forerunner of some separatist drive.

Policy implications of the existence and use of a provincially administered PIT

1 The power to modify the provincial PIT will be used to the fullest extent. In the revenue structure of any modern government, the PIT assumes a very major importance. It is reputed to be the most equitable tax, and this characteristic is not lost on governments in search of additional revenue. In Quebec, in the mid-1960s, the Provincial Commission of Inquiry on Taxation recommended a more intensive use of the PIT relative to other taxes. Changes in the provincial PIT will not be limited to changes in tax rates, tax credits, or personal exemptions: they will touch on all aspects of the tax structure, including the definition of income for tax purposes. Government will also use the PIT to implement various policies through incentives of one kind or another. All of this will be a constant source of disparity between the federal PIT and its provincial counterpart.

2 Provincial tax administration implies that over time provincial revenue officials will develop their own approaches, methods, and traditions that will add to the political and financial factors making for federal-provincial divergences in PIT. In any government, officials provide a significant input into legal drafting. But nowhere is this more important than in the case of tax laws, of which legislators usually have an understandable awe. The resulting divergences are of greater consequence in increasing compliance costs than most other divergences because they often have a direct impact on accounting rules for tax purposes.

One need not assume that officials must be a priori opposed to tax harmonization for these divergences to emerge. On the contrary, tax officials will often seek parallelism in tax interpretation and administration; thus there are systematic exchanges of information on tax assessments and tax interpretations between Quebec and Ottawa. However, differences in administrative timetables, strongly held opinions, etc,. will, over time, take their toll.

3 Tax harmonization has a lower order of priority than almost all other objectives that mould a provincial PIT. Sometimes, problems of taxpayer compliance brought about by widening divergences will push governments into greater parallelism in their tax laws. This is remedial rather than preventive action. A government will sometimes find it convenient to abrogate features of the PIT brought in by a preceding government, especially if it is of a different persuasion. A change in policy may be labelled 'harmonization' to minimize controversy. However, it should be apparent that in the absence of any institutional mechanism working towards harmonization, references to harmonization express pious wishes rather than policy objectives.

NOTES

1 Had Quebec signed the tax rental agreement, it would have received in 1952-53 an estimated tax rental payment of $115 million. That amount would have grown with GNP and population figures in subsequent years. In 1954-55, the first year of implementation of the Quebec PIT, direct tax receipts amounted to only $91 million ($25 million for the PIT, $51 million for the corporate profits tax, and $15 million for succession duties). In addition, PIT collection cost Quebec an estimated $1 million. Therefore, the apparent financial loss to Quebec was on the order of $25 million (Canada Year Book 1952-53, 1,058; Quebec Public Accounts, various years).

2 Duplessis' consistency in linking his case about taxation to the constitutional allocation of spending responsibilities is well documented in Black (1977). That case was first expounded by the Quebec premier in his brief to the Rowell-Sirois Commission of 1937, then at the 1945 and 1946 federal-provincial conferences on fiscal arrangements, and again in an exchange of letters between Duplessis and the federal minister of finance, Douglas Abbott, in early 1952. This exchange also illustrates Ottawa's dissimulation of its real intentions in the matter.

3 The perception of a link between taxation issues and use of the spending power, especially in the area of education, was reinforced by what Black (1977, 427) describes as 'one of the more inane examples of federal-provincial non-cooperation.' The question at issue was the deductibility for purposes of computing the federal corporate income tax of a Quebec tax on the paid-up capital (in excess of $1 million) of telephone companies. That tax had been imposed specifically to retire debt of school boards. Ottawa disallowed the deduction until the Exchequer Court ruled that it should be allowed. The debate lasted from 1946 to 1953.

4 Quebec's preference for taxing powers over cash was not predicated merely on a conservative political philosophy but also on the province's prevalent nationalism. The more spendthrift governments of the 1960s displayed the same inclination. However, Quebec was confronted with a much starker choice before 1957 and equalization. Duplessis' success led to the abandonment of tax rental and the introduction of equalization payments independent of tax collection arrangements, thereby considerably easing for his successors the problem of choice between fiscal autonomy and financial returns. Another indication of Duplessis' preference for smallness in government lies in the fact that although Quebec was not a party to the 1947-52 tax rental arrangement, no provincial personal income tax was levied during that period, a fact which Duplessis later referred to as evidence of his 'good faith' (Black 1977, 436).

5 The events surrounding the creation of the commission and the non-publication of its widely leaked report are well recounted in Durocher and Jean (1971).

6 This resentment was heightened by the fact that these developments appeared to bear out the suspicion that the centralist ploy mapped out by the Rowell-Sirois Commission was gradually being implemented.

7 See Trudeau (1968, 79). This piece is a translation from Cité Libre, February 1957, and also appeared in L'Action Nationale in 1957. The theme developed by Trudeau in this paper was first worked out in a brief that he prepared for a labour union for presentation to the Tremblay Commission in March 1954.

8 An implication of Quebec's original claim of a priority right in direct taxation was unlimited and automatic deductibility of provincial taxes from federal taxes or tax bases; in such a situation Ottawa could have continued to levy direct taxes only by sufferance from the provinces. This is what was meant in the language of the period by tax 'deductibility' as opposed to tax 'reduction'. Quebec's abandonment of full automatic deductibility was a step fully consistent with its abandonment of fiscal priority. It seems that this more extreme position was never seriously considered by Duplessis, though it was by the Tremblay Commission.

9 The then provincial leader of the opposition Liberal party, Georges-Emile Lapalme, gives a description of those events in his memoirs (1970, 170-81). That account reveals its author's own naiveté in

basing his strategy on such a major issue on a verbal commitment by the federal finance minister, Douglas Abbott, to his shadow finance spokesman, George C. Marler - himself in caucus a determined opponent of the provincial PIT. There is considerable irony in Marler's conveying that telephone conversation to Lapalme in February 1954, then becoming federal minister of transport in July and participating in the federal cabinet's November decision to concede the point to Duplessis. At no time was there a direct exchange between St. Laurent and Lapalme about that momentous issue!

10 Union Nationale propaganda before the election hammered the point home unhindered by so much as an attempt at rebuttal by the disheartened Liberal party. The images of Duplessis as a winner and Lapalme as a loser were firmly implanted. The lesson was not lost on their successors. Nationalistic 'machismo' was revived with a vengeance; indeed, the political consequences of Duplessis' political victory were probably felt right down to the 1980 referendum. On the 1956 and subsequent elections, see Lemieux (1969).

11 This section covers fiscal developments to the end of 1982.

12 Québec 1965, 96 (author's translation).

13 Journal des Débats, 23 June 1972, 1,598 (author's translation).

14 The rationale for the 1967 replacement of exemptions for dependent children by family allowances was that exemptions are more valuable to the rich than to the poor. Making allowances taxable would have pushed the same reasoning even further - perhaps, it was thought, too far, especially since Ottawa never considered doing away with exemptions for dependent children, although it did consider taxing provincial family allowances in the hands of the parents! So much for vertical equity - that is, the unequal treatment of differently situated taxpayers. The non-taxation of family allowances on grounds of horizontal equity was based on the very objective of the Quebec family allowance policy, which was to reimburse a family for a given percentage of the marginal cost associated with the presence of dependent children: taxation of the benefits meant that this objective could not be attained equitably between families having the same income but different numbers of dependent children.

15 On this point see McKercher (1983).

REFERENCES

Black, Conrad (1977) Duplessis (Toronto: McClelland and Stewart)

Durocher, R., and M. Jean (1971) 'Duplessis et la Commission royale d'enquête sur les problèmes constitutionnels 1953-56.' Revue d'Histoire de l'Amérique française 25, 337-65

Lapalme, Georges-Emile (1970) Le Vent de L'Oubli: memoires tome II (Montreal: Leméac)

Lemieux, Vincent, ed. (1969) Quatre élections provinciales au Québec (Québec: Presses de l'Université Laval)

McKercher, W.R. (1983) The U.S. Bill of Rights and the Canadian Charter of Rights and Freedoms (Toronto: Ontario Economic Council)

Moore, A.M., H. Perry, and D.I. Beach (1966) The Financing of Canadian Federation: the Past Hundred Years (Toronto: Canadian Tax Foundation)

Québec (1965) Rapport de la Commission royale d'enquête sur la fiscalité

Roy, Jean-Louis (1976) La marche des Québécois: les temps des ruptures, 1945-1960 383 (Montreal: Leméac)

Trudeau, P.E. (1968) 'Federal grants to universities.' In Federalism and the French Canadian (Toronto: MacMillan)

Cost of Government Administration of a Separate Ontario Personal Income Tax System

A. E. John Thompson*

Operation of a personal income tax system by a government involves more than administration in its narrow sense. The appropriate tax policy must be struck through analyses by public servants, consideration of representations from the public, and discussion and decision by political leaders. Furthermore these policy decisions must be turned into rigorous legislative language and general explanatory material before the administrative apparatus can take over.

The administrative process, with which this paper is mainly concerned, has the arduous task of turning legislated decisions into rules that can be applied to millions of individuals in a myriad of different circumstances to determine what is viewed as their appropriate share of the personal income tax burden. Regulations must be drafted, forms issued, explanatory material printed, returns processed, money collected, and so on.

Such requirements would not be onerous if the personal income tax were a flat rate of 2 per cent and only affected 2 per cent of the population, as was the case when it was introduced in the United States late in the last century. However, the personal income tax has evolved into one of the most complex fiscal tools in modern society. Moreover, it is now the most important single source of tax revenue in industrialized countries. Top rates have been pushed so high that they are perceived to have deleterious effects on incentive and avoidance. Complicated networks of provisions have been assembled in order to meet a variety of social objectives, to influence investment behaviour, and to support or discourage certain types of personal expenditure. These provisions continually change with evolving social mores and political objectives. As the state

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has developed welfare programs, these too have been tied in with the income tax system.

THE CANADIAN CONTEXT

These characteristics of a modern, personal income tax system are as apparent in Canada as they are in any other industrialized country. For the federal government and most provincial governments, the personal income tax provides the most important and fastest growing single source of tax revenue. The Canadian PIT system relies on self-assessment. The level of compliance is probably relatively high, although it may well be declining in the face of the system's growing complexity and recent efforts by the federal government (for example, in respect of restricted interest rules) to tighten its operation. By comparison, a sales tax is relatively impersonal and (generally speaking) collects relatively more feathers for less squawking.

Despite the fact that the provinces receive about one-third of the total personal income tax revenue (in Quebec, about one-half), the Canadian personal income tax system is primarily designed by the federal government and, under a collection agreement with nine of the provinces, administered by the federal government. Quebec has had its own personal income tax system since 1954, but despite several significant differences, it largely follows the federal pattern.

The federal collection agreement with the nine provinces followed from experience during the Second World War. The collection service is provided for no fee, except with respect to certain provincial tax credits for property taxes, sales taxes, etc. that have been introduced in recent years. Tax is remitted to the provinces as it becomes receivable; the federal government retains interest penalties and bears bad debts. A considerable amount of taxpayer information is provided to the agreeing provinces.

Both levels of governments have numerous welfare programs that are partially integrated with the income tax system.

In considering the costs that could be faced by the Ontario government were it to adopt its own personal income tax, it will be useful to start with the federal experience in operating the Canadian personal income tax system, since any Ontario system would presumably be similar. The consequences of adapting the federal experience to the Ontario situation

can then be considered. Quebec's experience with its own personal income tax system, discussed briefly below, is also a valuable guide.

ADMINISTRATION OF A PERSONAL INCOME TAX SYSTEM

The main features of government administration of a personal income tax system of the Canadian type can be readily obtained by looking at the federal government's experience with its system. In so doing, it is convenient to separate the various functions into two general categories: 'mandatory programs' - functions that must be carried out if one is to have a system at all; and 'non-mandatory' or 'enforcement programs' - functions whose importance depends upon the desired effectiveness of the system. While division of particular functions between these two categories is blurred, the breakdown is useful in evaluating the cost of running a personal income tax system. Because of the sheer volume of individual tax returns and the demands of a self-assessment system in a democracy, the costs of the mandatory programs are much more significant than the costs of the enforcement programs. The reverse is true under the corporate income tax system, where there are relatively fewer taxpayers (with less demand for mandatory programs), but more complexities (with greater scope for error and avoidance).

On the basis of federal government's experience, the various activities involved in operating a department for the collection of personal income tax revenue are set out below.

Mandatory programs

1. Forms, design, and distribution. Under a complicated personal income tax system that operates on a self-assessment basis, the importance of the design of forms, and of their timely distribution, cannot be overemphasized.
2. Public enquiries. For those who prefer oral to written explanations, or cannot understand written explanations, the Revenue department must be prepared to answer endless enquiries through district offices, telephone calls, and correspondence. The provision of appropriate facilities is important both politically and in terms of encouraging taxpayer compliance.
3. Operating procedures. These provide the basis for the whole oper-

ation of handling millions of returns, a process that includes preparation of technical commentary for the two functions described above, the programming of computer systems, and the setting out of detailed procedures to be followed in processing returns, balancing employer remittances, etc. Federal procedures fill several operational manuals which in both official languages are reputed to occupy four and one-half feet of shelf space. To be effective, these procedures must of course be very detailed and constantly revised.

4. File maintenance. To facilitate enquiries, enforcement, and collection, a complete tax roll must be maintained, with supporting files for each individual taxpayer. The drawing and refiling of returns is necessary for assessing, audit, and collections, as well as for taxpayer-requested adjustments. This humdrum task is costly.

5. Employer remittances. Because the bulk of the personal income tax cash flow comes from employer deductions, continual control is essential. Even though this is basically a matter of mechanical bookkeeping, constant follow-up and annual auditing are found to be very necessary activities.

6. Revenue accounting and control. Again, a mechanical but voluminous task, involving the proper accounting and control of payments and tax assessments, and the calculation of interest credits and penalties.

7. Initial processing of returns. Whether returns are assessed in detail or not, there have to be proper systems for prompt processing, including the issue of assessment notices and refund cheques or tax bills.

8. Taxpayer-initiated reassessments. One of the surprising features of the PIT system is the volume of reassessments that arise at the request of the taxpayers - reputedly over one-half of the total volume of personal tax reassessments. Requests of the 'oh I forgot to tell you' sort have to be complied with if the system is to function, and therefore at least one-half of the reassessment procedure can be regarded as more or less mandatory.

9. Appeals. While perhaps not large in volume, these are demanding technically. Once an objection is filed by the taxpayer, the department must respond.

Enforcement programs

10. Collections. Collection actions begin with routine asssessment notices and follow-up letters from the computer, and later involve legal action in the form of a garnishee or a writ for seizure. While this program might

be considered essential for any system that tries to collect money, the degree to which it is enforced is a matter of discretion.

11. Enforcement of filing. This is to ensure that taxpayers who are on the rolls keep filing and that those who are not commence filing.

12. Tax-collector-initiated reassessments. This category of activity includes assessments and reassessments on the basis of a desk review and verification of items claimed, without an actual examination of taxpayer records.

13. Audit. This activity involves an actual examination of a taxpayer's books and records, especially where business operations are involved or the taxpayer is an officer of a corporation that is under review. Investigations for tax evasion also come under this heading. Audit is probably the most variable of all the enforcement programs.

Overhead

14. Central policies, procedures, personnel, and administration. All of the activities or programs described above require a central group of personnel who design policies, procedures, and programs, and provide personnel and administrative support. This requirement can be assumed to increase with the size of the mandatory and enforcement programs.

REQUIREMENTS FOR AN ONTARIO PERSONAL INCOME TAX SYSTEM BASED ON FEDERAL EXPERIENCE

Personnel requirements

Officials of Revenue Canada - Taxation in Ottawa have provided a detailed estimate of the person years in their department that relate to Ontario individual taxpayers. Estimates for most activities are based on actual experience of personnel directly engaged in administering income tax applicable to Ontario individuals. Only for certain activities - such as head office and operating procedures - has it been necessary to make pro-rated estimates. Consequently, the estimates provide good evidence of the share of person years devoted to collecting personal income tax revenues from Ontario residents, of which revenues every $3 is approximately $2 federal and $1 Ontario. The breakdown of these person years

TABLE 1
Person years required to administer personal income tax in Ontario

	Estimate of federal requirement for Ontario taxpayers[a]	Estimate of potential Ontario requirment
Mandatory programs		
1. Forms design & distribution	150 - 175	125 - 150
2. Public enquiries	325 - 350	275 - 300
3. Operating procedures[b]	175 - 200	150 - 175
4. File maintenance	425 - 450	400 - 425
5. Employer remittances	350 - 375	325 - 350
6. Revenue accounting & control	300 - 325	300 - 325
7. Initial processing of returns	725 - 750	700 - 725
8. Taxpayer-initiated reassessments	225 - 250	200 - 225
9. Appeals	175 - 200	100 - 125
	2,850 -3,075	2,575 -2,800
Enforcement programs		
10. Collections	325 - 350	300 - 325
11. Enforcement of filing	150 - 175	75 - 100[c]
12. Tax collector-initiated reassessments	225 - 250	100 - 125[c]
13. Audit	650 - 675	350 - 375[c]
	1,350 -1,450	825 - 925
Overhead		
14. Central policies, procedures, personnel, and administration	400 - 425	375 - 400
Total person years	4,600 -4,950	3,775 -4,125

NOTES:
a Based on estimates supplied by officials of Revenue Canada - Taxation.
b For programming and operation of computer facilities, as well as production of manuals for all procedures required in dealing with personal returns.
c Assuming a reciprocal exchange of information between federal and Ontario tax authorities.

by the programs described above is set out in Table 1.

With some adaptation, these estimates should provide a realistic guide to the personnel requirements for an Ontario personal income tax system. Granted, there are difficulties in making this adaptation. The extent to

which an Ontario personal income tax system would be modelled after the federal cannot be forecast, although it is assumed that the general pattern would be similar. Some assumptions must also be made about the degree to which Ontario would seek to demonstrate that it had its own system by issuing complete sets of forms and the extent to which it would strive to maintain tax yields of about one-half the federal revenue from the province. Nevertheless, some reasonable judgments can be made, and this has also been done in Table 1.

Some further comments should be made regarding the estimated Ontario requirements. For example, with respect to item 1, forms design and distribution, it is assumed that Ontario would produce tax return forms and explanatory documents that were complete in themselves, even though many of the rules would duplicate those of the federal PIT system. Some slight cost reduction would be achieved because the existence of federal forms would reduce the need for original design work. However, reductions in costs achieved by deriving benefit from the federal lead would be limited because of the need to produce forms concurrently. Some further simplification of Ontario forms and some further reduction in cost might be achieved if Ontario followed the same practice as in its corporate tax returns, where federal tax calculations and schedules are referred to wherever possible and the provincial variations are highlighted. However, in view of the higher political profile of the personal income tax, it is assumed that Ontario would want forms that were complete in themselves.

With respect to item 2, public enquiries, it seems safe to assume that there would be less call for this service at the provincial level than there is at the federal level, since the provincial system would be largely patterned after its federal counterpart. Yet the reduction would probably not be very significant. Experience in Quebec indicates that taxpayers will ask both provincial and federal offices the same question, to see if the answers are similar! Furthermore, since the provincial government is somewhat closer to the people, the political pressure to be responsive to requests could be relatively higher.

With respect to item 3, Ontario would probably have to produce its own complete set of operating procedures. The federal manuals are internal documents and presumably would not be exchanged with a provincial government. In any case, the need for constant and quick revision would also make any exchange arrangement very difficult.

The cost to the province of the other mandatory programs would

probably be very similar to their cost to the federal government although a slight reduction would result from the fact that fewer dollars of tax revenue were at stake. Personnel requirements for item 9, appeals, could be lower, since the provincial department might await the outcome of federal appeals on the same issues.

The main scope for a relative reduction in provincial personnel requirements would lie in the enforcement programs. Accordingly, a significant reduction is estimated in relation to enforcement of filing, tax-collector-initiated reassessments, and auditing. It would be unsafe, however, to assume a drastic reduction, since the federal government might be unwilling to exchange reassessments and filing enforcement experience with the province unless the latter had a reasonable enforcement program of its own. Furthermore, enforcement of particular Ontario variations in the income tax system - and these would undoubtedly arise - could require additional personnel. Collection procedures would have to be fully maintained, and they might even be competitive with the federal procedure.

It is assumed that central personnel requirements would be slightly lower for the province than they are for the federal government, since there would be relatively less tax revenue involved, and that since some personnel are already available with respect to the Ontario corporate income tax. Nevertheless, it would seem unwise to expect much saving relative to federal personnel costs in this area, since the start-up of the system could require a lot of central planning. Moreover, ovehead costs might be relatively lower in the larger federal tax system.

In summary, it is estimated that the personnel required for an Ontario personal income tax system would only be some 15 per cent fewer than the personnel presently used by the federal government in relation to the same Ontario taxpayers. This duplication of about 4,000 employees would stem from the fact that the operation of a personal income tax system in Canada mainly requires programs that are basically essential to the system and that could not be significantly reduced even if an Ontario system were patterned closely after the federal system. Furthermore, a new bureaucracy of such magnitude would take on its own life and growth.

Overall costs based on federal experience

The main costs of a separate Ontario personal income tax system can be derived from the above estimate of personnel requirements, and from other

federal experience. A brief summary of the main components would be as follows:

		$
Personnel	- 4,000 person years @ say $22,000 each	88,000,000
Space for personnel at various locations	- say 1,500 employees @ 100 square feet each @ $15 per square foot	2,000,000
Computers, say		5,000,000
Forms		13,000,000
Transportation and other, say		12,000,000
		120,000,000

The balance of the 4,000 personnel would be located in, say, a data centre. On the basis of federal experience, such a data centre would have a capital cost on the order of $60 million.

EXPERIENCE WITH QUEBEC PERSONAL INCOME TAX SYSTEM

Quebec's experience with its personal income tax system provides another realistic guide to the potential costs of an Ontario system. The Quebec system is well established, having been in effect since 1954. Although the law is drafted separately, it generally follows the federal legislation. Nevertheless, there are numerous differences between the Quebec and the federal systems, and it cannot be assumed that the differences under a separate Ontario system would be fewer than - or the same as - the Quebec variations on the federal theme. However, the Quebec experience does suggest the order of magnitude that would be involved.

Because of the smaller scale of operations, the costs of the different functions are not as clearly identifiable in Quebec's case as they are in the case of the federal administration. Nor is it possible to clearly identify the costs of operating the Quebec personal income tax system as a whole. The Quebec revenue department has three main operations - corporate and personal income taxes and succession duties, sales and excise taxes, and rights and permits. It also issues transfer payments under welfare programs. No separate accounting is maintained for these separate functions,

but some rough estimates can be made.

For the fiscal period 1980-81, the total costs incurred in the Quebec revenue department were as follows:

	$	$
Personnel costs		
Employees	97,000,000	
Outside professional and administrative services	2,000,000	
		99,000,000
Other operating costs		
Travelling	8,000,000	
Rent	3,000,000	
Furniture and equipment	6,000,000	
Other	6,000,000	
		23,000,000
Total personnel and operating costs		122,000,000
Other costs		
Compensation to vendors	18,000,000	
Transfer payments	25,000,000	
Interest on tax refunds	25,000,000	
		68,000,000
		190,000,000
Less interest penalties		
Personal income tax	50,000,000	
Other	40,000,000	
		90,000,000
Total		100,000,000

Roughly two-thirds of the department's total costs relate to income taxes and succession duties, and of that two-thirds, perhaps 70 per cent, or 47 per cent of the whole, relates to the personal income tax system. Thus, the personnel services involved in the Quebec personal income tax system (whether provided by employees or by outside personnel) could cost about $47 million annually, and the total personnel and operating costs related to personal income tax could be $57 million annually. Conversion to the Ontario situation, which involves more than half again as many individual taxpayers, indicates comparable estimates of $70 million and $85 million respectively. These figures are smaller than the estimates based on the federal government's experience. It may also be noted that the entire Quebec revenue department, which has three main operations, employs about 4,600 full- and part-time staff.

INTANGIBLE COSTS OF A SEPARATE ONTARIO SYSTEM

In addition to the tangible costs estimated above, there would be intangible costs of a separate system that should at least be put on record.

A separate system would involve further uncertainty and delays in the implementation of tax changes. Experience with federal budgets in recent years has been particularly bad, with proposals hanging in the balance for a year and with taxpayers, tax returns, and assessments in a state of uncertainty in the meantime. While the same types of delays might not occur in a provincial legislature, a separate system would tend nevertheless to result in more changes and therefore more delays than there are at present. The result would be added inefficiency in the governmental process, with a real but immeasurable cost.

From the government's standpoint there would also be a cost in terms of political dissatisfaction. In any discussion of the implications of a separate Ontario personal income tax system, the unanimous unsolicited reaction is unfavourable and unprintable. While this feeling might subside after such a system were operating, it would still be there and the whole process would then be irreversible.

More broadly, if Ontario were to adopt its own system, the raison d'être for a federal collection system would be very much diminished, affecting the overall efficiency of the government process in Canada and helping to break up the fabric of the country.

OTHER COST COMPARISONS WITH PRESENT ARRANGEMENTS

If Ontario were to adopt its own personal income tax system, it would take on the bad debts for taxes owing, but pick up its share of interest penalties and possibly reduce the cost of administering its welfare programs.

Under the present collection agreements, the federal government pays the provinces as the taxes become receivable and bears the cost of bad debts itself. At present, the Ontario share of taxes outstanding for more than two years is on the order of $35 million, and of taxes overdue for less than two years it is about $42 million. The breakdown of interest penalties cannot be readily determined, although Quebec's experience suggests that the net interest income could offset the bad debts.

A cost reduction argument for Ontario having its own PIT system is that it would be possible to integrate the system with welfare programs.

However, this possibility would have to be examined in considerable detail before any significant saving could be realistically projected. The experience of federal officials is that there is difficulty in integrating the two. Welfare payments are usually made currently, whereas income tax figures are a year old. Income tax data can be used for verifying welfare claims, but this data is already available to the province from federal computer tapes.

Assumption by Ontario of its own personal income tax would reduce the burden of administration on the federal government, and possibly reduce its cost. However, discussion with senior federal officials indicates that the saving would be immeasurable and probably quite small. Presumably some degree of saving would emerge over time, if only because the volume of tax dollars being collected in Ontario would be reduced by one-third. However, dealing with Ontario's share of PIT revenues is only a part (albeit a major one) of the overall federal income tax system, and the ongoing momentum of an existing administrative system that is not overstaffed would delay any reductions.

CONCLUSION

Given the above analysis, the general conclusions about the additional costs of administering a separate Ontario personal income tax system are abundantly clear. Because of the nature of the present Canadian personal income tax system, a separate provincial system would require a duplication of most of the administrative machinery that the federal government already uses to collect the same tax from the same taxpayers. The cost of this additional Ontario administration would be on the order of $75 million annually. In addition, there would be considerable start-up costs and a capital investment in buildings of some $60 million. There would be no noticeable decline in the costs of administering the federal personal income tax system.

Costs of Taxpayer and Employer Compliance Under a Separate Ontario Peronal Income Tax System

A. E. John Thompson*

WHAT WOULD A SEPARATE PERSONAL INCOME TAX SYSTEM MEAN?

For the majority of individual taxpayers whose income comes primarily from employment, the main recurring costs of compliance with a separate Ontario personal income tax (PIT) would fall on the employer in deducting tax at source. The recurring costs to employees would be only the immeasurable aggravation costs of being uncertain of the basis for the provincial tax deducted. For such individuals, the main hurdle and cost of compliance would come at tax return time. Even then, the taxpayer who could face the wad of material involved would find with sufficient patience that the additional income tax return was not as difficult as it appeared. Those who could not face the paperwork would have to collect various receipts and other bits of information and turn them over to a nearby income tax service. Individuals with a variety of personal obligations, investments, or business activities would take more interest in welfare programs, tax rates, incentives, and other special provincial measures. They could affect the taxpayer's plans, and thus lead him to rely on professional advice.

For employers, a separate Ontario PIT system would also mean dealing with separate tax deduction tables and separate collection agencies. Provincial budget changes would require more changes in computer programs than they do at present, since income or taxable income would have to be calculated as well as tax rates. Significant variations in provincial income taxes from province to province would complicate arrangements for employee transfers.

Some impression of the impact that a separate Ontario PIT might have

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on the individual taxpayer can be obtained by comparing the tax forms that face a Quebec individual under that province's separate tax. For the 1981 taxation year, the Ontario resident was presented with a booklet that contained instructions, tax tables, and tax return forms and schedules in duplicate, covering both federal and Ontario income tax. There were sixteen pages of instructions, eight pages of tax tables, a four-page form, and ten schedules. The calculation of Ontario tax credits required a single page.

In Quebec, the individual received not only the same federal package (without the Ontario page), but also a package of similar bulk from the province. This contained a thirty-page guide (of smaller dimensions than the federal guide), a four-page tax form, thirteen schedules, and a separate page for a real estate tax refund.

While the Quebec forms and instructions follow the general format of the materials prepared by the federal government, there are numerous differences that have to be sought out. The taxpayer with few complications can perhaps ignore most of the material and simply prepare his return from the form itself. The cost of individual taxpayer compliance might then be low, but wastage of extra material and effort is evident. For taxpayers in more complicated situations, additional uncertainties are added in planning one's activities, and there is additional need for professional advice.

RELIANCE ON THE FEDERAL PIT SYSTEM

A province's main objective in adopting its own PIT system is to gain more scope for adopting specific tax measures, suitable for its own purposes, that will differ from the provisions of the federal system. Nevertheless, in estimating the costs of taxpayer and employer compliance under a provincial PIT system, it seems reasonable to assume that at the outset the provincial system would duplicate to a considerable extent the mechanism of the federal system. Given that the provinces (except Quebec) receive less than one-half of the personal income tax revenue income raised in their jurisdictions, it seems very unlikely that a province would adopt an income tax base radically different from the federal model.

Adoption of the same general patterns for determining income, taxable income, and tax rates, and some reliance on the assessment and collection procedures of the federal government, would make compliance much less

onerous than it would be if Ontario were to build a PIT system from scratch. The costs of complying with a separate Ontario income tax can therefore be appropriately viewed as marginal; in other words, it can be assumed that the federal PIT system is in place, and that the Ontario system closely resembles it. Consequently, we are looking at the additional costs involved in complying with a separate Ontario PIT that is largely modelled on the federal system.

The next step is to consider what variations Ontario might adopt if it had its own PIT system, with a view to estimating the likely effect of these variations on compliance costs.

POSSIBLE VARIATIONS IN A PROVINCIAL PIT SYSTEM

Contemplation of a separate provincial personal income tax, as distinguished from the present collection arrangements with specific tax credits, can spawn visions of basic tax reform. Thoughts of expenditure tax in place of income tax, integration of corporate and personal income taxes, and tax-based income policies (TIP) can fire the imagination. However, if any of these basic reforms were valid, surely they would be valid only if the principal participants in the system moved in concert. To be realistic, therefore, and to reiterate what has already been stated in general terms just above, it is assumed here that any changes introduced through a separate Ontario personal income tax system would be within the general framework of the present federal tax structure. While such provinical moves could be in the desired direction, and the separate provincial personal income tax system could influence federal changes, it is assumed that any basic reforms would be adopted jointly after cooperative discussion.

Even given these constraints, there is a considerable variety of measures that could be adopted under an Ontario personal income tax system. These measures could affect the income base (through modifying income inclusions or deductions), the taxable income computation (through changing exemptions), or the tax calculation (through rates and credits). To put the matter another way, specific measures could be adopted for revenue, ability to pay, and incentive or disincentive purposes.

EXPERIENCE IN THE PROVINCE OF QUEBEC

The motive for adopting a separate personal income tax might not be the

same in Ontario as it was in Quebec, and the thrust of social and economic policies could be different. The result in either case would be differences in the two provinces' PIT policies. Nevertheless, Quebec's experience with its separate PIT system provides concrete evidence of the types of changes that one might expect to find in Ontario. A commentary on the experiences of a professional tax accounting advisor under the Quebec system appears in Appendix A. Table 1 is a summary of the ways in which the Quebec PIT has departed from the federal PIT. It will be noted that certain of the significant purposeful measures have been listed in the left-hand column under the headings of revenue, equity or redistribution, savings and investments, and special incentives. These measures could be categorized more simply as revenue, equity, and incentive measures, although the dividing lines between the categories are not altogether clear. One of the main revenue-raising measures has been the non-indexing of the tax rate table. With respect to equity or social policy, the province provides higher basic exemptions, higher top rates, different reliefs for children, and real estate tax refunds. Significant incentives have been provided in the form of a deduction from income up to $15,000 for a stock savings plan, an investment tax credit of 25 per cent on SODEQ shares, and permission to deduct current service contributions to a registered pension plan up to $5,500 rather than $3,500. The recent budget introduced a special extra incentive in 1982 for housing, allowing a deduction of $3 for every $1 of RHOSP contribution; in 1983 the RHOSP deduction was discontinued completely.

There is an even longer list of variations that may be categorized as nuisances, at least from the standpoint of the taxpayers. These measures may stem from different social or political views (such as the different rate progression, the higher benefits for company cars, or ineligibility of capital gains for the $1,000 deduction), or from a different bureaucratic view as to what is appropriate (such as the computation of the benefit from a company car, the treatment of interest expense in computing the $1,000 deduction, and the former difference in the treatment of RRSP deductions if the employee was a member of a DPSP). Finally, in a catch-all category, there are an increasing number of differences in bureaucratic interpretation of precisely the same tax legislation!

It is therefore evident from the Quebec experience that in addition to the three types of motives for variations mentioned above (revenue, equi-

TABLE 1
Ways in which Quebec personal income tax has departed from federal personal income tax

Purposeful	Nuisance
Revenue	
1. Non-indexing of tax rate table.	
Equity or redistribution	
2. Higher basic exemptions. 3. Higher top rates. 4. Different reliefs for children. 5. Real estate tax refunds.	1. Different rate progression. 2. Higher benefit for company cars.[a] 3. Lower deductions for personal cars. 4. No education deduction. 5. No housing loan exemption.[a] 6. Benefit from employee loan not computed on same basis.
Savings and investments	
6. Current service contribution $5,500 rather than $3,500. 7. Deduction up to $15,000 in stock savings plan. 8. Investment credit of 25% on SODEQ shares.	7. Capital gains not eligible for $1,000 deduction. 8. All interest expense deductible re $1,000 deduction. 9. Capital loss deduction of $1,000 not $2,000.
Special incentives	
9. $3 for $1 RHOSP contribution for 1982 only.	10. No special stock option treatment CCPCs. 11. Contribution to RRSP limited to $3,500 if employee member of DPSP (federal now has the same limit when contribution to DPSP made in the year). 12. RHOSP cannot be used to buy a house from the spouse in Quebec. 13. For 1983 and following years contribution may be made to RHOSP but no deduction.
Miscellaneous	
10. Unpaid balance is always subject to interest charge; interest on refund starts only 60 days after filing or 30 April, whichever is later. 11. Child care expense limits $2,000/child and $6,000/family instead of $1,000 and $4,000 federally.	14. Limitation in deduction of legal fees to obtain maintenance payments (Quebec 133.3); may be allowed by federal (IT-99R). 15. Differences in interpretation of the same legislation.

a Before the federal budget of 12 November 1981.

ty, and economic incentives) there are at least two more: politics and bureaucracy. These are not frivolous observations, for they are very relevant to a realistic estimate of the costs of complying with a separate personal income tax system.

EXPERIENCE UNDER THE ONTARIO CORPORATE INCOME TAX

While it is not directly analogous, experience under the separate Ontario corporate income tax also provides some indication of the what would happen under an Ontario personal income tax.

The Government of Ontario has declared an intention to use the federal corporate income tax base and legislative rules to the greatest possible extent. Furthermore, copies of federal tax assessments are automatically supplied to Ontario's Corporate Revenue Department. Nevertheless, as indicated in Appendix C, there are numerous differences both in the computation of the tax base, and, especially, with respect to incentive measures. The Ontario budget of 31 May 1982 indicates that these differences may increase, with exception being taken by Ontario to significant federal changes in respect of first-year capital cost allowance, reserves, and iron ore processing. When cumulative calculations such as capital cost allowance are subject to different rules, the implications for taxpayer compliance are significant, since the prime advantage of the existing capital cost allowance system has been its simplicity. Such variations in the tax base are not possible under the collection agreements.

If Ontario were to adopt its own PIT system, it would ostensibly be for the purpose of adopting measures that could not be successfully carried out under the present tax collection agreements or, alternatively, under other types of government programs such as grants. The present tax collection agreements with the federal government are in fact quite flexible and permit a variety of tax credits. At the same time, the federal government has taken a stand that it will not administer tax credits that indirectly change the tax base or promote interprovincial competition. This still leaves a province free to adopt grant or expenditure programs to achieve objectives without federal constraints. These can and have been used for both social and economic purposes. The fact remains, however, that politically and from the standpoint of businesses, tax measures have more appeal than grants. The latter appear to be more socialistic and less consistent with private enterprise. Furthermore, it is possible for political

pressure to modify the tax base (in terms of marginal rates, exemptions, personal benefits, etc.) in ways that are perceived to more closely reflect the social views of people in Ontario. It is difficult to visualize the federal government continuing to administer provincial personal taxes that breached the two restrictions it has laid down.

REASONABLE ASSUMPTIONS AS TO VARIATIONS THAT WOULD LIKELY ARISE UNDER A SEPARATE ONTARIO PIT

Based on the above observations, it seems reasonable to conclude the following:

1. Variations that Ontario would adopt under a separate PIT system would likely be similar in pattern to those experienced in Quebec, even if they were adopted for slightly different reasons. The variations would generally be within the framework of the existing PIT system, but they would be numerous, both for political and for economic reasons.
2. Some of the incentive measures would be significant and effective, others would be ineffective. The pressure on a provincial finance minister to be seen to be taking action would inevitably lead to some ineffective measures.
3. Because of the nature of personal income taxes, numerous variations would be introduced to meet social objectives. These would likely be more satisfying to the initiators (namely the politicians) than to the persons to whom they are directed (namely individual taxpayers). If they were supported by the residents of Ontario, their introduction would likely be accompanied by a sentiment against the federal government and add to disunity within Canada.
4. The bureaucracy that would be created to administer the PIT system would in itself inevitably create further differences in the technical administration of the law, adding to compliance costs and aggravation.
5. Any effort of self-discipline on Ontario's part to not make any changes in the basic computation of income would likely be unsuccessful, given the difficulty of any two persons' agreeing on a neutral tax base and the importance of social factors in determining the income of individuals.
6. Since Ontario would have certain social and economic objectives different from those of Quebec, there would in effect be three rather than two PIT systems in Canada.

COST OF COMPLIANCE BY INDIVIDUAL TAXPAYERS

Preparation of returns

Estimating the cost of preparation of individual provincial personal income tax returns sounds like a simple task, but it isn't. For starters, there are no readily available statistics on the fees paid for returns prepared professionally, which represent a very significant percentage (possibly 30 to 40 per cent) of all individual tax returns. For individuals who prepare their own tax returns, there are costs that may be immeasurable, but that cannot be ignored. The time and mental effort involved in preparing one's own return, whether this takes one hour or ten hours, is a diversion from economically productive activities or at least from leisure, both of which have an opportunity cost. In today's lingo, preparing returns must also affect the quality of one's life. Finally, there are the many employees who obtain assistance in completing their returns from their employers' personnel department, but who do not pay a distinguishable fee for that service.

Another problem in measuring the probable cost of complying with an Ontario income tax is that it would be a marginal cost. Such an estimate would assume that a federal PIT system was in place and, consistent with the preceding commentary, that the provincial income tax system was substantially similar in structure to the federal system but contained specific differences. Based on experience in the province of Quebec (see Appendix A), the marginal cost for the provincial return could be on the order of 25 per cent of the total cost of preparing the federal and provincial returns.

Given these difficulties, and time and budget constraints, it has not been possible to come up with a sophisticated and reliable estimate of the cost that would be involved in a separate Ontario PIT. However, it is possible to indicate some orders of magnitude. Table 2 provides such an estimate, based on federal statistics of taxable Ontario individuals in 1979. For each of the major occupational categories, an estimate has been made of the percentage of returns prepared professionally (category 2) and those prepared by the individuals themselves (category 1). A minimal opportunity or loss-of-leisure cost has been attributed to the latter category. This very rough estimate indicates a cost of preparing returns on the order of $75 million to $225 million. On the basis of this quick and crude analysis, the cost of preparing returns could therefore be on the order of $150 million a year.

TABLE 2

Estimated costs of preparing provincial personal income tax returns[a]

	Number of individual taxpayers (000's)	Range of cost per return[b] (%)	(000's)	($)	Range of total cost ($000,000's)
Employees	3,019	1.[c] 75%	2,264	@ 10 to 25	22.6 to 56.6
		2. [20%]	604	@ 25 to 50	15.1 to 30.2
		[5%]	151	@ 100 to 400	15.1 to 60.4
			3,019		52.8 to 147.2
Farmers & Fishermen	36	1. 25%	9	@ 25 to 50	.2 to .5
		2. 75%	27	@ 150 to 200	4.1 to 5.4
			36		4.3 to 5.9
Professionals	37	1. 25%	9	@ 50 to 100	.5 to .9
		2. 75%	28	@ 100 to 400	2.8 to 11.2
			37		3.3 to 12.1
Salesmen	9	1. 50%	4	@ 25 to 50	.1 to .2
		2. 50%	5	@ 50 to 200	.3 to 1.0
			9		.4 to 1.2
Business proprietors	108	1. 25%	27	@ 25 to 50	.7 to 1.4
		2. 75%	81	@ 50 to 200	4.1 to 16.2
			108		4.8 to 17.6
Investors	193	1. 25%	48	@ 25 to 50	1.2 to 2.4
		2. 75%	145	@ 50 to 200	7.2 to 29.0
			193		8.4 to 31.4
Pensioners	115	1. 75%	86	@ 10 to 25	.9 to 2.2
		2. 25%	29	@ 25 to 50	.7 to 1.5
			115		1.6 to 3.7
Unclassified	56		56	@ 10 to 100	.6 to 5.6
	3,573		3,573		76.2 to 224.7

a Ontario taxpayer statistics derived from Taxation Statistics, 1981 edition. Issued by Revenue Canada - Taxation and based on taxable returns for 1979.

b Marginal cost of provincial return, assumed to be approximately 25 per cent of total cost of preparing a federal and a provincial return.

c Category 1 represents self-prepared returns; category 2 represents returns prepared for a fee.

Other costs of individual compliance

The costs of individual compliance would not end with the tax return itself. There would be separate tax instalments to be paid by many taxpayers; clarification of instalment payments with the collection department; responding to questions about tax returns; disputing provincial tax assessments.

If significant provincial incentives were introduced, professional tax planning advice would presumably be required even if the incentives were relatively simple in their application. The percentage of taxpayers affected would likely be relatively small - say less than 5 per cent - so that the magnitude of tax planning dollars per se would not appear to be very significant. However, the opportunity cost involved in diverting this group of individuals from other activities would be high. If only 100,000 individuals were affected, at an average additional annual cost of only $100 each, the total cost would amount to $10 million a year.

COST OF COMPLIANCE BY EMPLOYERS

Because the bulk of personal income tax is deducted at source by employers, costs to employers form an important part of compliance costs. According to 1979 federal taxation statistics for Ontario, 3,019,000 taxable returns out of a total of 3,573,000, or about 84 per cent, were from employees. They reported federal taxable income of $34.3 billion out of a total personal income of $41.8 billion and federal tax thereon of $8.7 billion out of a total of $10.5 billion.

Many functions contribute to the employer's cost of compliance. The amount and mechanics of payroll deductions have to be established. The amount of deductions have to be reported to employees by pay stubs or other methods. Someone has to manage the cash flow. Information returns have to be filed. When a new budget comes along, programs or procedures have to be amended. Many large employers now provide personal financial advice services for employees, and they would have to be extended to cover any new provincial income tax. The appropriate financial arrangements for interprovincial moves by employees would become more complex and more companies would be induced to use outside advisory services.

Apart from the task of identifying the direct personnel and material

costs, space costs, and overhead management costs, the further difficulty with respect to a new provincial income tax would be measuring the marginal impacts.

It is noted in Appendix A that the matter of compliance costs under the Quebec system was discussed with two large Ontario-based companies that have operations across Canada. On the basis of their experience with their Quebec employees, it appears that the total annual marginal costs of a provincial income tax could run an average of about $10 or $20 per employee. The start-up cost for such a separate PIT would be about the same as the annual cost. The advantages of mechanization would decrease with a smaller number of employees, so that presumably smaller-sized businesses would be faced with a higher additional cost per employee. Table 3 suggests a format for estimating an employer's compliance costs.

While such sampling would have to be extended to develop reliable statistics, it appears that the cost of employer compliance with an Ontario PIT for 3,000,000 employees could be on the order of $30 million to $60 million per year, with an equivalent amount being incurred in the year of start-up.

EFFECTS OF PROVINCIAL TAX INCENTIVES ON INDIVIDUAL BEHAVIOUR

Presumably one of the reasons for launching a separate provincial PIT would be to have more flexibility in affecting individual behaviour through tax incentives. Certainly the impact of the combined federal and Ontario income tax has brought a response from the individual taxpayer. Many taxpayers have sought tax shelters through investments in MURBs, films, real estate development, oil and gas, etc. Others have formed investment corporations to cut down the impact of the top marginal rate. Those with small incorporated businesses obtain annual advice as to the best mix of salary and dividends, the optimum use of holding companies, etc. Ways have been devised for splitting income between members of a family. More routine tax planning measures such as taking maximum advantage of registered pension arrangements, RHOSPs, the $1,000 investment income deduction, etc., have become rather automatic and widespread.

Special tax planning actions such as tax shelters depend for their impact on a relatively high marginal rate effect. Under a separate provincial personal income tax, which would occupy only one-third of the field, the tax leverage on individual behaviour would be much reduced. In the

TABLE 3
Estimated additional employer costs of complying with a separate provincial personal income tax[a]

Nature of operations		
Number of employees	Ontario	
	Quebec	
	Elsewhere	
Personnel administration costs (total)[b]		
Employee relations		
Payroll		
Computer		
Other		
Start-up costs of a separate provincial PIT[b]		
Computer		
Other		
Additional annual costs of a separate provincial PIT[b]		
Reprogramming one or two changes		
Routine payroll, banking procedures		
Personnel relations		
Financial counselling for staff		
Staff moves[c]		
Interprovincial	No.	
U.S. to Canada	No.	
Other	No.	

a Using Quebec experience as a guide.
b Employee remuneration, supplies, equipment cost, and related overhead.
c Excluding equalization payments, but including cost of outside services for tax returns, and cost-of-living indices.

absence of very clear incentives, such as the combination of postponement and permanent savings available under the Quebec stock savings plan, there might be little real change in the actions of taxpayers. The only

real effect would be to lower tax revenues from certain individuals and add complexity to compliance.

In Ontario, the 30 per cent grant given to individuals towards the cost of purchasing equity shares in a small business development corporation is actually a more flexible program than a tax incentive would be. The effectiveness of such a program may depend as much on the counsel of investment dealers as on the tax planning advice of professional accountants and lawyers. In short, it might not be possible to provide many additional incentives under a separate PIT that would really affect taxpayer behaviour. The danger would be an illusion of a potential range of incentives which would merely complicate the tax mechanism. In any event, assuming that such incentives could be provided within the general context of the existing PIT system, the introduction of a separate provincial PIT would not seem to add a significant dimension to tax planning activities.

CONCLUSIONS

1. The introduction of a separate Ontario PIT system would impose a significant additional compliance burden on individuals, who would have to deal with both a second set of tax forms and the differences between the Ontario and federal tax systems.
2. An Ontario system would likely stay within the general framework of the federal system and would assume the existence of the federal tax administration. Consequently, the costs of an Ontario system can be viewed in a marginal sense.
3. Although an Ontario system would be generally the same as the federal system, experience in Quebec demonstrates that it would develop numerous specific variations. These would be adopted not only for revenue, economic, and social objectives, but also as a result of political and bureaucratic pressures.
4. Since the Ontario government occupies only about one-third of the personal income tax field in the province, it is unlikely that special Ontario tax incentives would achieve their objectives.
5. It is difficult to estimate the costs of compliance with a separate Ontario PIT system, but rough estimates can be made. The additional annual costs of individual compliance under a separate Ontario system could range from $75 to $225 million, or be on the order of, say, $150

million. Employer compliance costs could range from $30 to $60 million a year, or be on the order of, say, $45 million, with start-up costs of about the same amount. Additional tax planning costs could be $10 million. In other words, rough estimates indicate that the total costs of compliance would be $200 million annually.

APPENDIX A
EXPERIENCE WITH QUEBEC'S PIT FROM THE VIEWPOINT OF A PROFESSIONAL TAX ADVISOR*

In 1954, the Quebec government decided to set up its own PIT system. This decision came about as a result of years of disagreement and quarrelling with Ottawa. Quebec claimed that it found itself at the mercy of the federal government with regard to the time and amount of payment of its share of personal income tax. In those days, Ottawa collected all personal income tax and remitted its share to each province. The Quebec government was dissatisfied with this arrangement and took it as an opportunity to assert its autonomy, a term very much in style in Quebec at the time.

The PIT system originally adopted by Quebec was very similar to that of Ottawa. The Quebec civil servants entrusted with the responsibility of implementing the new system could thus benefit from the federal experience in matters of interpretation and administration. Subsequent to Quebec's adoption of its own PIT system, the Quebec minister of finance often followed passage of the federal budget with an announcement that he would harmonize Quebec's tax legislation with Ottawa's. In the past few years, however, the discrepancies between the two systems have become more apparent, resulting in the use of different income tax returns for federal and provincial filing.

This separate personal income tax collection system does offer some advantages to the Quebec taxpayer. For example, it allows Quebec to adopt measures that are more in keeping than the federal alternatives with regional aspirations. The effect of a federal regulation that does not favour Quebec in any particular way may be cancelled out by a regulation enacted in Quebec. Taxes collected by the Quebec government represent more than 50 per cent of the total amount of taxes paid by Quebeckers.

* This appendix is based on a report prepared by Pierre Gill, tax manager in the Montreal office of Coopers & Lybrand, Chartered Accountants.

The measures taken by Quebec are therefore as important in the province as those implemented by the federal government.

Personal income tax collection ensures more stable financing of the Quebec government, which in turn can maintain social programs that are better suited to Quebec's needs. However, these few advantages also lead to the undesirable balkanization of Canada.

The inconveniences created by the Quebec tax collection system outnumber its advantages. To start with, all Quebec taxpayers face the problem of filing an additional income tax return. They must either master the form themselves or pay for outside help. Thus Quebeckers face higher costs for paying their personal income tax than residents of other provinces. Second, the taxpayer must deal with both differences between federal and provincial tax legislation and differences in the interpretation of the same legal text, since in more and more instances identical sections of the federal and provincial tax acts are being interpreted differently by the two levels of government. The Quebec taxpayer must therefore convince two levels of government of the correctness of his interpretation of the law. The whole post-filing process, including notices of assessment and appeals, is clearly more onerous in Quebec because of this duplication. It is also more likely that the Quebec taxpayer will see his income tax return reassessed in detail than will residents of other provinces, who do not have to report to two levels of government.

VARIATIONS IN THE QUEBEC PERSONAL INCOME TAX

The ways in which the separate Quebec system has been used to realize the province's own fiscal, social, and other objectives were summarized in Table 1. Some of the intentional variations are classified in the table as 'nuisances', since that is the perception of the taxpayer and his advisor, despite the intention of government. Even where there are not legislative differences between the federal and provincial systems, the Quebec minister of revenue will in various instances interpret differently a section of the law that was meant to be in harmony with federal law. One of the best examples is the deduction for automobile expenses that is allowed to employees and salesmen on commission.

According to the Quebec government, any employee who receives a travel allowance, no matter how small, that he is not obliged to declare as income in accordance with the law, cannot claim any travelling expenses.

The Quebec minister of revenue has been issuing notices of assessment for years denying any claim for automobile expenses made by employees in this situation. Revenue Canada, according to Interpretation Bulletin IT-272, allows the employee who has received travel expenses that are not reasonable to include them in his income and then claim actual travel expenses.

Another difference in interpretation emerged when the decision in the Harman case (regarding expenses of an automobile provided to a travelling salesman) was made public. Quebec alleges it is not bound by this decision because it was made on the basis of the federal Income Tax Act.

There is also the case of the $1,000 interest and dividend deduction (110.1[1]) as it applies to a separate return made on behalf of a deceased taxpayer, in accordance with subsection 70(2). Paragraph 3 of Revenue Canada's Bulletin IT-326 clearly grants the deduction while Quebec, with equivalent provisions, refuses this deduction systematically.

This last example demonstrates the difference in interpretation of identical provisions. Paragraph 150(1)(b) of the federal Income Tax Act (Quebec 1,000 [2][c]) deals with the date of filing of the last return of a deceased person by his or her legal representative. The federal interpretation is clearly stated in paragraph 3 of Information Bulletin 73-1R3 as six months after death or the following 30 April, whichever comes later. We have been aware in the Montreal office of at least two instances in which the Quebec Revenue Department did not accept this interpretation and stated that the return should have been filed within six months of the death. After lengthy discussions at the highest levels, we managed to convince Revenue Department officials to endorse the federal position.

These examples show how Quebec residents not only have to put up with deliberate differences set out by legislators in income tax law, but also have to face different interpretations of laws that legislators intended to be identical.

FEES FOR PERSONAL TAX ADVICE

Like many if not most other accounting firms, we use a computer to complete personal tax returns. The Quebec return is prepared in conjunction with the federal return and we cannot establish very precisely the portion of our fees that is attributable to the Quebec return. However, experience has shown us that supplementary costs are incurred in the transmission of returns. There are also additional fees for items such as the

determination of car expenses, addition of further information, collation, and responses to Quebec assessment notices and requests for additional information.

	Number of clients	Range of fee	Estimated fee for Quebec return
Federal and Quebec	600	400-1,500	About 25-30% of the fees
Federal, Quebec & U.S.	35	1,000-2,000	About 15-20% of the fees

COSTS OF EMPLOYER COMPLIANCE WITH QUEBEC PIT

We have asked two of our clients to express their opinions on administrative costs linked to payroll and personnel departments. These two businesses have employees in Quebec and in at least one other province including Ontario.

The first client uses an outside payroll system and states that there is no difference between its costs for Quebec employees and the others. The client added that having to deal with two levels of government does cause problems, but that the amount of additional administrative costs is not significant. However, the outside service agency may incur costs that are spread over all provinces.

The second business has its own computer and payroll program. The person responsible for data processing mentioned that he modifies the program himself when changes occur in the federal and provincial income tax acts. Specific costs related to Quebec employees are marginal. Additional information is indeed required, but the computer can easily provide it. It seems also that there would be no reduction in payroll personnel if Quebec stopped collecting its own PIT. The biggest problem, according to this employer, occurs when he wants to transfer an employee from another province to Quebec; he then has to absorb the cost of the difference in taxation rates and also the cost of non-taxable benefits that become taxable, such as house loans.

In summary, it seems that any additional administrative costs are absorbed initially and remain marginal. Therefore, payroll and personnel costs are not much higher for Quebec employees than they are for those in other provinces in the case of large businesses that are computerized. On

the other hand, in the case of manual payroll systems, which are found mainly in small businesses, it seems that 25 per cent of payroll costs can be attributed to the fact that Quebec has its own PIT collection system.

EFFECT OF QUEBEC TAX INCENTIVES ON TAXPAYER BEHAVIOUR

To our knowledge, no statistics have been published regarding the Quebec Stock Savings Plan, implemented in 1979. However, newspaper articles and a survey involving four large brokerage houses in Montreal have indicated a sizeable increase in new investors on the stock exchange. After a fairly sluggish start in 1979, the number of new accounts in 1980 indicated a large increase. The same phenomenon took place in 1981. It seems that the companies that profited the most from these investments, and consequently from investor confidence, are the large national and multinational companies, such as Bell Canada, Northern Telecom, Alcan, The Bank of Montreal, The Royal Bank of Canada, and Canadian Pacific. Smaller Quebec-based companies, such as Bombardier, Provigo, Gaz Metropolitain, Comterm, and National Bank of Canada, also benefited from this renewed investor confidence. It appears that a few of these companies would have had difficulties in selling their shares in the absence of the Quebec Stock Savings Plan.

There seem to be two basic categories of investors. First, there are those investors who already owned a portfolio of shares listed on the stock market even before the institution of the plan in 1979. Second, there are those who became first-time investors as a result of the new plan. It appears that investors who belong to the first category regard their stock saving accounts as part of their main portfolios and view them as a means of diversifying their portfolios. This approach can be seen as a matter of shuffling accounts in order to take advantage of tax shelters. The investors belonging to the second category have traditionally invested their savings in bonds and term deposits, and now use the services of a broker. Brokers have mentioned that new regular accounts were opened and certain customers were beginning to make transactions outside the plan, thus managing their savings in a new way. The brokers we spoke with all agreed that this trend will have a very positive impact on stock market activity.

One of the main reasons behind the Quebec government's decision to raise the maximum deduction for contributions to a registered retirement

plan to $5,500 per year is the fact that contributions were limited to a percentage of salary in the case of certain employees, some of whom were civil servants. In many instances, the contributions were in excess of the $3,500 limit, and the increase now allows these taxpayers to deduct the extra $2,000. However, on the basis of our clients' income tax returns, we can say that contributions in excess of $3,500 are not very common and that the increase in the limit of contributions has not caused a very noticeable increase in the contributions made to these plans.

One can assert without doubt that it is costlier to do tax planning for a resident of Quebec than it is for a resident of any other province. Canadian tax publications often suggest elements of tax planning, such as the remuneration of the shareholder-manager through a combination of salary and dividends. Such examples can easily be adapted from one province to the other, but it is difficult to rely on the conclusions of these analyses in the case of Quebec taxpayers without modifying, sometimes substantially, these conclusions.

It is also obvious that a separate tax system leads to a search for new tax loopholes at the provincial level. Appendix B describes an example of a tax loophole at the federal level which resulted from the separate system for Quebec.

OTHER EFFECTS OF THE QUEBEC PIT ON TAXPAYER BEHAVIOUR

It is very difficult to pinpoint the reasons for the departure of Quebec residents for other provinces. However, one cannot deny that high personal taxes have always been invoked as a partial justification for the exodus of head offices and manufacturing companies. Businesses that cannot fill certain positions with Quebec residents have had to recruit candidates in other provinces or outside the country. These employers are often shocked by the amount of money they have to provide in order to keep the candidate's after-tax income at par. This situation is certainly not very conducive to bringing in skilled workers and management-level employees into Quebec. Moreover, it could be a considerable deterrent for individuals in other provinces who are contemplating a move to Quebec.

The attempt is often made to correlate the rate of personal income tax with a lack of incentive to work harder. Many taxpayers in Quebec do believe that once their income increases beyond a certain bracket any effort to earn more will only profit the tax collector. However, it is very

difficult to measure this phenomenon or its impact on the economic output of the province.

APPENDIX B
EXAMPLE OF A LOOPHOLE ARISING FROM AN ANOMALY UNDER THE SEPARATE QUEBEC PIT

The foreign tax deduction under subsection 20(12) of the Canadian Income Tax Act (ITA) and section 146.1 of the Quebec Taxation Act (QTA) is an example of such an anomaly. We have made a review of the situation that prevailed before and after the 1981 taxation year for a better understanding of it.

Under section 126 of the ITA and section 772 of the QTA, a taxpayer may deduct from the tax otherwise payable an amount determined by a formula for the foreign non-business income taxes paid to a foreign country that are attributable to income from a source outside Canada. The excess of the foreign tax paid over the allowable credit may in certain circumstances be deducted under subsection 20(12) of the ITA and section 146.1 of the QTA.

For taxation years ending before 1981, a taxpayer was entitled under 20(12) for federal purposes to a deduction for the excess of the total non-business income tax paid over the federal foreign tax credit as defined in section 126 of the ITA without any regard for the foreign tax credit allowed at the provincial level. For Quebec purposes, the taxpayer was permitted to claim a deduction under 146.1 (section equivalent to 20[12]) for the excess of the total non-business income tax paid over the provincial foreign tax credit as defined under 772 of the QTA without reference to the federal tax credit allowed. It was therefore possible to claim a full or part deduction under section 146.1 for which the taxpayer had already received a tax credit.

In Bill 42, assented to on 18 March 1982, the Quebec government changed the QTA. For the 1981 and subsequent taxation years, in the calculation of the section 146.1 deduction the taxpayer must reduce the foreign tax paid by the amount allowed under section 126 of the ITA. Therefore, a deduction will no longer be available in Quebec for an amount already credited federally. A deduction may still be allowable under 20(12) of the ITA, even though a foreign tax credit was claimed for the full amount for federal and Quebec purposes.

The following example illustrates one client's situation.

	1980 $	1981 $
Foreign tax paid	47,944	69,335
Foreign tax credit		
- Federal	30,583	30,180
- Quebec	17,361	39,155
	47,944	69,335
Deduction under 20(12)	17,361	39,155
Deduction under 146.1	30,583	NONE
Tax reduction relating to the 20(12) and 146.1 deduction	16,174	14,059

APPENDIX C
SUMMARY OF DIFFERENCES BETWEEN FEDERAL AND ONTARIO CORPORATE TAXATION

Summarized below are the main differences between the Ontario and federal corporate income tax provisions. These differences include those that have resulted from the enactment of the 12 November 1981 and 28 June 1982 federal budgets and the 1982 Ontario budget. Differences in the taxation of resource corporations federally and provincially (Ontario) are noted separately.

Liability for income tax

1. Federal

A corporation resident in Canada is subject to tax on its world income. A corporation not resident in Canada is subject to tax on its taxable income if it carried on a business in Canada or disposed of taxable Canadian property.

A non-resident entertainment corporation is subject to withholding tax of 15 per cent on gross revenue from performances given in Canada. This

tax is subject to refund upon filing a tax return by a nonresident corporation where the corporation is entitled to a refund.

2. Ontario

If a corporation resident in Canada has a permanent establishment in Ontario, it will be subject to tax on taxable income allocated to Ontario. For purposes of the act, the definition of permanent establishment for Ontario purposes is essentially the same as that for federal purposes. However, this definition is extended to include any corporation that produced, mined, created, manufactured, fabricated, improved, preserved, or constructed anything in Canada in the taxation year. Also, for corporations whose taxation year ends after 19 May 1981, a corporation's 'registered office' will be included with the 'head office' as constituting a permanent establishment in the jurisdiction, unless the corporation has a permanent establishment elsewhere in Canada.

A non-resident corporation is subject to tax in Ontario if it owns and receives income from the sale or rental of Ontario real properties or timber resource properties, or disposed of a taxable Canadian property that was situated in Ontario.

After 19 May 1981, non-resident entertainment corporations were no longer liable for corporation tax. Prior to this date withholding tax of 5 per cent on gross revenue from performances in Ontario was imposed, subject to any refund entitlement upon filing an Ontario corporations tax return.

Calculation of net income for tax purposes

1. Capital property - investment tax credit

For federal tax purposes, an investment tax credit is treated as a form of government assistance which reduces the cost of capital property. If the property is depreciable property, capital cost allowance can be claimed only on the net cost of the property after the deduction of the tax credit.

For Ontario purposes, investment tax credits are treated in the same manner as for federal purposes except that prior to 8 March 1978 the credit claimed did not reduce the cost of property.

2. 115 per cent depreciable cost incentive

For federal tax purposes, an incentive was granted for certain manufacturing and processing assets acquired in the years 1970 to 1972 whereby the depreciable cost of these assets was increased by 15 per cent. For Ontario tax purposes, this incentive was not granted.

3. Ontario's Beef Calf Stabilization Program

For Ontario tax purposes, payments or refunds from this program are included in income.

For federal tax purposes, there is no provision to include these amounts in income.

4. Interest on loans to non-resident persons

For federal tax purposes, interest is imputed at a prescribed rate on low interest or on interest-free loans by resident corporations to non-resident persons (except subsidiary controlled corporations), unless non-resident tax is withheld or paid by these loans.

For Ontario tax purposes, interest will be imputed on all low interest or interest-free loans by resident corporations to non-resident persons. There is no exclusion with respect to loans on which Part XIII tax is paid (non-resident tax).

5. Management fees, rents, royalties, and other similar payments to non-residents are fully deductible in computing the net income of a corporation for federal tax purposes, even if such amounts are subject to non-resident withholding tax.

For Ontario tax purposes, a corporation must include 5/14 of management fees, rents, royalties, and other similar payments made after 11 April 1979 in the calculation of net income for tax purposes when such payments are subject to federal non-resident withholding tax.

6. Regulations for determining the deduction for capital cost allowance

For federal and Ontario tax purposes, depreciable assets are classified

under different classes of capital property. Both the federal and Ontario acts provide for the same classes of assets. However, the capital cost allowance that may be deducted on these classes can differ.

Pursuant to the 12 November 1981 federal budget, only one-half of the capital cost allowance that could be formerly claimed in the year of acquisition can now be claimed on assets acquired after 12 November 1981.

For Ontario tax purposes, the capital cost allowance deduction allowed in the year an asset is acquired will remain at the normal rate of write-off currently provided and will not be reduced by one-half.

7. Reserves on capital gains

Following the 12 November 1981 budget, for federal tax purposes a corporation can claim a reasonable reserve for proceeds not due until after the year-end, provided that at least one-fifth of the gain times the number of taxation years which have elapsed since the disposition has been included in income. Thus, one-fifth of the gain, as a minimum, must be included in income in the year of the sale and in each of the subsequent four taxation years, regardless of the length of the repayment period.

For Ontario tax purposes, the reserve provisions remain unchanged. Consequently, a corporation does not have to include in income that portion of the capital gain that can be attributed to unpaid instalments, until such instalments are paid.

8. Income reserves

For federal tax purposes, a corporation may deduct a reserve for that portion of the profits from the sale of land or property other than land that is not due until a later year.

For Ontario tax purposes, a reserve cannot be deducted if the corporation disposes of a mortgage or other security that is taken as full or part payment for the sale of property within a year after the disposition of the property.

Pursuant to the 12 November 1981 budget, a company cannot claim a reserve for federal tax purposes with respect to a sale occurring more than 36 months before the end of the year. This provision will not be adopted for Ontario tax purposes.

9. Foreign taxes

For federal tax purposes, a corporation can deduct foreign nonbusiness income tax in lieu of a foreign tax credit in certain cases.

For Ontario tax purposes, foreign non-business income tax is deductible after 10 May 1981 only to the extent that it has not been deducted as a credit for federal income tax purposes.

10. Taxable Crown corporations

For federal tax purposes, corporations owned by the federal government that are named in the federal regulations are subject to federal income tax.

For Ontario tax purposes, if named in the Ontario regulations, certain corporations which are owned by federal, provincial, or municipal governments will be subject to Ontario income and capital taxes.

11. Deductible corporation taxes

For Ontario tax purposes, a corporation tax other than corporation income tax is deductible. There is no similar provision in the federal Income Tax Act; however, it is Revenue Canada's assessing policy to allow companies to deduct a corporation tax other than a corporation income tax.

12. Payments received under the Employment Support Act

For federal tax purposes, the above-noted payments are taxable.

For Ontario tax purposes, these payments are not taxable. Also, federal grants received under the Area Development Incentives Act, the Industrial Research and Development Incentives Act, or the Regional Development Incentives Act are exempt from tax.

13. Foreign tax carry-over on amalgamation

For federal tax purposes, a foreign tax carry-over from predecessor corporations to a new amalgamated corporation will be allowed. There is no similar provision in the Ontario Tax Act.

14. Partnerships and their members

For federal tax purposes, each taxpayer deemed to be a member of a partnership which carries on a business in Canada in a taxation year shall be deemed to carry on that business in Canada in that year.

There is no equivalent provision in the Ontario Corporations Tax Act. For Ontario tax purposes, corporate members of the partnership are deemed to have a permanent establishment in Ontario if the partnership activity would render it liable for tax.

Computation of taxable income

1. Political contributions

For Ontario tax purposes, election contributions, up to a maximum of $4,000 for any taxation year, are allowed as a deduction from taxable income. Any unclaimed amount may be carried forward or deducted in succeeding years.

There is no similar provision allowing a deduction of political contributions in the federal Income Tax Act. However, the federal Income Tax Act does allow a tax credit up to a maximum of $500 to be deducted from taxes payable.

Calculation of income tax payable

1. Small business deduction

Canadian-controlled private corporations eligible to claim a small business deduction will be taxed at less than full rates on the first $200,000 of business income earned in a year. For federal purposes, companies engaged in providing professional, managerial, administrative, or similar services (i.e., engaged in non-qualifying activities as that term is defined in the Income Tax Act) are taxed at a higher rate (23-1/3 per cent) on business income than those not providing such services. These other companies are taxed at 15 per cent on their business income.

For Ontario tax purposes, a single effective tax rate of 10 per cent was applicable for corporations claiming a small business deduction. No distinction was made between corporations earning non-qualifying business

income and those earning qualifying business income.

Following the 1982 Ontario budget, for Ontario income tax purposes those corporations engaged in qualified activities and eligible to claim a small business deduction under subsection 125(1) of the Income Tax Act will not have to pay tax on their business income earned in a taxation year ending after 31 May 1982 and before 14 May 1984.

2. Foreign tax credit

For federal tax purposes, the foreign tax credit is available in relation to foreign investment income and foreign business income.

For Ontario tax purposes, the foreign tax credit is allowed only in respect of foreign taxes paid on foreign investment income.

3. Incentive tax credit for investment

For federal tax purposes, all corporations may claim an investment tax credit based on the cost of certain specified depreciable assets acquired or for certain expenditures incurred. (As discussed earlier, any investment tax credit claimed on capital property will reduce the capital cost of the property.)

For Ontario purposes, only Canadian-controlled private corporations qualifying for the federal small business deduction are permitted to claim a tax credit. This credit is based on an amount up to 20 per cent of the cost of depreciable property purchased between 22 April 1980 and 23 April 1982 if this property is used in Ontario to earn income from a business. This credit is limited to a maximum of $3,000.

4. Manufacturing and processing profits credit

Although both taxing authorities offer a tax credit for corporations engaged in manufacturing and processing, there are policy differences in the calculation of the manufacturing and processing credit.

For federal purposes, the credit is based on 'Canadian manufacturing and processing profits'. The Ontario credit is based on 'eligible Canadian profits', which involves a computation of income on a basis acceptable for Ontario tax purposes. The Ontario profit base includes elements derived from mining, farming, logging, and fishing; the federal base does not.

For federal tax purposes, Canadian manufacturing and processing profits eligible for the small business deduction qualify for a manufacturing and processing tax credit. For Ontario tax purposes, Canadian profits eligible for the manufacturing and processing credit are reduced by the amount of any active business income included therein which is eligible for the federal small business deduction.

For Ontario purposes, all of a corporation's active business income qualifies for the credit if total active business income does not exceed $250,000 and active business income from sources other than manufacturing and processing, mining, farming, logging, or fishing does not constitute more than 20 per cent of total business income. At the federal level, a similar rule exists for small manufacturers with active business income not in excess of $50,000 (to be increased to $200,000 under the federal budget of 12 November 1981).

5. Political donations credit

As previously noted, the federal Income Tax Act allows the taxpayer to deduct a credit of up to $500 for any federal election contributions made during the year. The Ontario act has no similar provision.

6. Employment tax credit

For federal income tax purposes, qualified employers are eligible to deduct an employment tax credit from Part I tax otherwise payable. Any unused credit may be carried forward for five years. There is no similar tax credit allowed for Ontario purposes.

Resource corporations

1. Resource allowance

For federal tax purposes, a corporation can deduct from business or property income a resource allowance based on 25 per cent of its resource profits from mining and oil and gas operations in Canada.

For Ontario tax purposes, corporations can deduct a resource allowance only on profits from oil or gas operations (including mining of tar sands) in Canada.

2. Depletion allowance

Ontario's depletion allowance is 33-1/3 per cent of resource profits, whereas at the federal level depletion is limited to 1/3 of the corporation's investment, up to a maximum of 25 per cent of resource profits. Depletion allowances for oil and gas companies are computed on the same basis for Ontario and federal purposes. However, the concept of earned depletion is applicable for federal purposes for taxation years ending after 6 May 1974 and for Ontario purposes for taxation years ending after 19 April 1977. Ontario does not provide incentives similar to those proposed in the Federal Petroleum Incentives Program.

3. Foreign resource property

For federal tax purposes, foreign resource properties are treated as income assets, and on disposition the proceeds of sale are added to the income that may be reduced by undeducted foreign exploration and development expenses.

For Ontario purposes, foreign resource properties are treated as capital assets and any expenses incurred are added to the adjusted cost base of that property.

4. Development expenses

For federal tax purposes, resource companies in the oil and gas or mining industries are entitled to a 30 per cent deduction for development expenses.

For Ontario tax purposes, resource companies in the oil, gas or mining industry are entitled to a 100 per cent deduction for development expenses incurred in Ontario. These corporations are also entitled to a 30 per cent deduction of development expenses incurred outside Ontario.

The Relationship Between Geographic Mobility of Individuals and the Structure of the Provincial Personal Income Tax

Sam Bucovetsky*

INTRODUCTION

This paper deals with the relationship between the geographical mobility of individuals and the structure of the provincial personal income tax (PIT). Any changes in the structure of Ontario's PIT may induce migration flows to and from Ontario. In assessing the effects of such changes one should know both how migration responds to the changes, and how this induced mobility affects the incidence of the changes. From a theoretical standpoint, the first issue is quite straightforward. People locate so as to maximize their real income - net of any moving costs. Hence a tax change that raises the real income available in Ontario to a given group will induce immigration to Ontario by that group. And of course a group whose real income is lowered will tend to emigrate. Actual measurement of this response to real income differences is an important empirical issue. I shall make a very brief survey of some of the research in this area later in the paper.

However, my main concern here is with how mobility affects tax incidence. Suppose, for instance, that one examined the implications of changes in Ontario's tax structure under the mistaken impression that Ontario's population was fixed. The main purpose of this paper is to point out how one's conclusions would have to be modified, given that people really are mobile. The changes in the tax structure that I shall consider are of a very rough and stylized nature. The analysis uses a simple two-class model, one that divides the population into 'skilled' and 'unskilled' labour. A change in the progressivity of the PIT is represented by an increase in the taxes payable by one group and a decrease in the

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taxes payable by the other group. (In fact, the province could probably achieve a change in mere progressivity - with no changes in tax-base definition - without opting out of the current piggybacking arrangement. On the other hand, Quebec's experience indicates that changes in progressivity may result from an independent PIT even if the independence was not motivated by any desire for such changes. The fourth section of the paper offers a brief discussion of the reasons why the political system may generate changes in progressivity under an independent PIT.)

Many changes in the structure of the PIT that would require opting out can be reasonably approximated in this sort of model. Thus the use of a separate PIT to extend to small business the preferential treatment currently embodied in the corporate tax structure would involve lower taxes for proprietors of small incorporated businesses and, if equal yield was to be preserved, higher taxes for others. Lower taxes on inflation-induced capital gains could be viewed as a reduction in tax rates for the high-income group, since financial assets are principally held by members of that group.

Note that in the present context, the relevant question with respect to changes in the tax treatment of capital income (of any sort) is 'where does the owner of the asset live?' When capital markets are as open as they are in Ontario, the location of investors and the location of investments do not necessarily coincide. Thus, the effect of a given policy change on capital flows will in turn affect the flow of people in and out of the province. There are two ways in which policy-induced capital flows can affect population flows. A policy that drives up the return on investment may eventually alter the marginal product of different types of labour, thus altering gross-of-tax wage rates and stimulating migration. Alternatively, a policy that reduces the tax liability on a given asset (for example, equity in Ontario-based corporations) may induce individuals who hold large amounts of that asset to move to Ontario.

The first three sections below derive some effects of mobility on tax policy, using the standard models of microeconomics. The analysis assumes throughout that perfect competition prevails in the markets for final goods and services and for factors of production. For the most part, full employment of all factors is assumed, so that the gross-of-tax income of a worker is the value of the marginal product of the type of labour he supplies. (Appendix 2 extends the analysis to a model of the Harris-Todaro type, in which full employment does not necessarily occur.) The

analysis considers a variety of assumptions about the mobility of factors of producton among jurisdictions. The case in which people are perfectly mobile, and so locate where their real net incomes are highest, is given the most attention. But even models in which all factors are assumed to be perfectly immobile can provide some insights, if the effects of an unexplained influx of workers of some type on wages and prices can be derived.

I have divided the ways in which mobility affects tax incidence into three categories. The next section discusses adjustments in the markets for factors of production. The third section discusses adjustments in the prices of final goods and services. The fourth section discusses adjustments in the budget constraint of the provincial government. Of course all three types of adjustment occur concurrently; my taxonomy is an expositional convenience.

By factor market adjustments I mean the effect on the gross wage rates paid to different types of labour of changes in the aggregate supply of the various factors. These adjustments may occur even if the prices of all final goods are unchanged. They are a major concern in the pure theory of international trade. However, there are difficulties in generalizing the strong, intuitive conclusions of the 'standard' two-factor model to one with heterogeneous labour. By goods market adjustment I mean the effect of the composition of population on the prices of final goods. Even goods that are traded on national markets may exhibit price changes when migration occurs. These changes could be due to the altered cost conditions in Ontario (and elsewhere in Canada) caused by changed factor proportions. In addition, however, the prices of non-traded goods in Ontario may change as the size and composition of the population change. Such demand-side effects have been explored in the literature on fiscal federalism. Although much of this analysis is directed to the municipal level, it has some applications to provincial policy. The third type of effect, changes in the provincial budget constraint, stems from the redistributive nature of our tax system. If the system takes more in taxes from some individuals than it costs (at the margin) to provide them with public services, then an immigration of such individuals represents a benefit. Since their presence adds a surplus to the provincial budget, taxes on all individuals may be lowered without reducing per capita expenditure. If, in addition, the local public sector has increasing returns in population (non-rivalry in consumption), then immigration would provide a

benefit even if there were no redistribution. For then the marginal cost of providing public output to a new resident would be less than the average cost of providing it to existing residents. In other words, the public sector makes money off such immigration if taxes equal the average cost. Much of the literature on the theory of local public goods concentrates on the latter effect of immigration.[1] However, the former effect, the result of redistribution, seems much more important. It is the phenomenon that underlies fears of tax competition among jurisdictions and the widely accepted dictum that redistribution is best left to the federal government. There is work in this area in the theory of local public goods, although perhaps less than might be expected.

The very simplest models used to analyse the above three types of effect suggest the following propositions concerning the effect of migration on the welfare of existing residents:

1. Immigration by some class of individuals hurts existing residents of that class.
2. Immigration hurts existing residents but benefits owners of scarce factors used in locally consumed output.
3. Immigration of rich individuals is beneficial; immigration of poor individuals is harmful.

The first proposition follows from the theory of marginal productivity. An increase in the supply of a factor lowers its marginal product, and thus its wage. The second propostion follows from the demand side. Increased population drives up demand for local goods. If their supply is less than perfectly elastic, the increase in population will result in higher prices to existing residents and increased returns to the owner of whatever factors cause the supply curve to slope up. The third proposition follows from the budget constraint. Rich immigrants add a surplus to the provincial budget; poor ones impose a deficit.

If these propositions are accepted, it follows that the mobility of the population will seriously attenuate the impact of provincial policy. A policy that redistributes from one group to another will presumably cause immigration by the gainers and emigration by the losers. Proposition 1 suggests that one of the results of this immigration will be a lessening of the original redistribution. A policy that enhances efficiency, or that reduces residents' tax burdens by exporting more taxes to outsiders, will

cause immigration. Proposition 2 suggests that this immigration will transfer some of the benefits of the initial policy change from residents to owners of the scarce factors used in locally consumed goods (such as housing). If the provincial government attempts to lower taxes on the poor by raising taxes on the rich, the rich tend to emigrate and the poor to immigrate. Proposition 3 suggests therefore that mobility will reduce the amount by which taxes can be lowered for the poor group (for a given increase in taxes on the rich).

The bulk of this paper consists of a survey of the relevant literature, to see to what extent the propositions just discussed are valid in more general, realistic models.

FACTOR MARKET EFFECTS

The Heckscher-Ohlin model

The standard model used to explain international and interregional trade is the Heckscher-Ohlin model.[2] It assumes that there are two commodities, which are produced from two factors of production. These factors are assumed to be completely immobile. Both commodities are assumed to be produced in every region. Clearly such a model, taken literally, is of limited relevance to the issue of factor mobility. But we can gain some insights from undertaking a brief examination of the basic model before we turn to some natural extensions of it.

The factor price equalization theorem states that the (gross-of-tax) wages of each factor will be the same in each region, despite immobility of factors. An immediate implication of this result is that migration of a factor from one region to another will have no effect on wages anywhere as long as the world prices of commodities are unchanged by this migration. Only the location of production (the Rybczynski effect) and patterns of trade will be altered.

Before jumping to the conclusion that fiscally induced migration has no effects on factor markets, one should note that this standard model of trade theory is inappropriate to the discussion of factor mobility. It has been noted that the movement of goods acts as a 'second best' substitute for mobility of factors (see Jones 1967). Factor mobility is inconsistent with the Heckscher-Ohlin model if there is any difference (such as in tax policy) between regions. Suppose that Ontario taxed capital income more

heavily and labour income less heavily than the rest of the world. If factor price equalization held, then the net return to capital would be lower and the net return to labour higher in Ontario than in the rest of the world. If factors were perfectly mobile, then capital would leave Ontario and labour would move to Ontario. This migration would eventually imply complete specialization in at least one region, invalidating one of the assumptions of the factor-price equalization theorem.

In fact it has been recognized by trade theorists that mobility of capital must lead to some specialization, even when labour is immobile, in the two-factor, two-good, two-country model with identical technologies. If only one good is produced by a region, and its price is fixed by world demand, then immigration of one factor must lower that factor's wage and raise the wage of the other factor. But note that with constant returns to scale and a given gross wage to one factor (determined by mobility) output price must be a monotonic function of the other factor price. Thus simple 2 x 2 models of production predict little effect from mobility on factor returns, if world prices are unchanged. On the other hand, they also appear inconsistent wth factor mobility.

Effects of migration with specialization in production

More meaningful results can be obtained if the two-sector model is abandoned. Suppose a jurisdiction produces only one good. If that good is produced by a neoclassical production function from two inputs, labour and capital, and both factors of production are immobile, then immigration must lower the real wage and raise the real return to capital. This conclusion, emphasized by Mishan and Needleman (1968), follows from the diminishing marginal rate of substitution between factors. However, if capital is perfectly mobile, then the real wage rate will be unaffected by migration. If $c(w, r)$ is the unit cost function,[3] and capital is in fully elastic supply at a real return of r/p (where w is labour's wage, r the return on capital, and p the price of the consumption good), then the real wage w/p is uniquely determined by the cost condition $c(w, r) = p$.

The simple results of this simple model are changed when more than two factors of production are considered. Suppose that output is produced (by a constant-returns-to-scale production function) by capital and two types of labour (skilled and unskilled is the usual dichotomy). Epstein (1974) examines the effects of immigration in such a model when

capital is assumed to be immobile. He assumes that a group of migrants enters a country. This group consists of both skilled and unskilled workers, but the composition of the group may differ from the composition of existing residents. The immigrants may bring some capital with them. This assumption, and a related one that all capital is owned by residents, seem ill-suited to inter-provincial migration (and probably to international migration as well). Epstein's results are somewhat surprising. He suggests, for instance, that the welfare of existing unskilled workers may be an increasing function of the proportion of unskilled workers in the immigrant population. The reasoning is as follows. Suppose that the two types of labour are very close substitutes. Then one can (almost) aggregate the two types of labour. If migrants are predominantly unskilled, they will lower the average quality of the (aggregate) labour force. If in addition they bring with them large stocks of capital, they may actually lower the ratio of effective labour to capital, and thus raise the wage rate.

This result is not terribly convincing. It does not arise when 'reasonable' parameter values are inserted. Thus, Epstein finds that actual migration to Canada (which was disproportionately composed of skilled workers and involved only small additions to the capital stock) lowered the wages of both groups, and lowered unskilled wages more. Also, the argument above obviously does not apply to skilled migrants. Finally, it depends heavily on the assumption of fixed capital stocks.

If this assumption is relaxed, as it is in Appendix 1, the results are simpler and more intuitive. Suppose that capital is perfectly mobile, but that both types of labour are completely immobile. Then an influx of type 1 labour must lower the wage of type 1 labour. It may raise the wage of type 2 labour, depending on the substitutability of factors.[4] Unfortunately, plausible values for substitution elasticities and factor shares leave the result ambiguous. And the immigration of type 1 labour will stimulate an inflow of capital if and only if increases in type 1 labour raise capital's marginal product (i.e., labour and capital are q-complements). Thus a simple one-good, three-factor model with perfect capital mobility tends to support proposition 1 above.

Note, however, the following effect of migration of one group on the welfare of the other group. Suppose an increase in employment of skilled labour lowers the marginal product of unskilled labour. Thus emigration of skilled workers makes unskilled workers better off (and vice-versa). If the tax system were to become more progressive, unskilled workers would

immigrate and skilled workers would emigrate. The immigration would partially undo the effect of the initial policy change of raising the welfare of unskilled workers. But the emigration would reinforce it. Thus if skilled workers are much more mobile than unskilled workers (as is often claimed), then migration may not weaken all the effects of redistributive policy.

Another model of migration in a three-factor, one-sector world is that of McCulloch and Yellen (1977). This model assumes that capital is mobile. But unskilled workers are completely immobile. And skilled workers are mobile only if the gains from migration exceed the costs. Finally, the model assumes that being skilled or unskilled is a matter of choice, depending mostly on one's investment in education. Thus public policy can alter the skill composition of a given group of residents. The policies that McCulloch and Yellen investigate are changes in the return on physical capital (holding constant the discount rate on human capital) and equal changes in all rates of return, the costs of education, and the costs of migration. Since migration is costly, their results depend on whether policy changes are large enough to induce migration. Of particular interest is the first policy change, since this is the sort of option that an independent PIT might make available. McCulloch and Yellen show that if the return on capital is increased, and increased enough to cause migration, the wage of the unskilled workers will fall, investment in education will rise, the ratio of unskilled labour to capital will rise, and average income will fall. Immigration of skilled labour must occur if skilled labour and capital are q-complements (i.e., increases in capital raise skilled labour's marginal product), but otherwise the direction of migration is ambiguous. It also should be noted that the results are subject to more ambiguity when all rates of return change simultaneously. As McCulloch and Yellen conclude (1977, 95), 'the results of this analysis underscore the importance of complementarity and substitutability relationships among factors in production.'

Much of the work on the implications of migration for the distribution of income seems to be motivated by a determination to justify Bhagwati's proposal (1975) to limit the 'brain drain' by taxation. Not surprisingly, the emphasis of this literature is on deriving the costs imposed by emigration of skilled labour on non-migrants. Berry and Soligo (1969) provide the following result. Suppose that we have a two-sector, one-output model, in which all residents own some labour and some capital. If emi-

grants' capital-labour ratio differs from that of those left behind, those left behind will be made worse off by emigration. In essence, the two groups with differing factor endowments provide 'gains from trade' (in factors) that are lost when one group emigrates.

Hamada and Bhagwati (1975) examine migration when sticky wages produce unemployment of both skilled and unskilled labour. Again, unskilled workers may become skilled through education until expected wages are equalized. In the simplest model, an emigration of skilled workers lowers unemployment of skilled workers, raises it among unskilled workers, and raises per capita income. More complicated models weaken these conclusions. But this avenue of approach seems a useful one for those, such as Boadway and Flatters (1981), who believe that rigid (or minimum) wages make equilibrium-unemployment, Harris-Todaro models relevant for Canada.[5]

The Harberger model

The most natural generalization of the one-sector models just discussed is the two-factor, two-sector model used by Harberger to discuss tax incidence.[6] In fact, this model can be used directly to examine interregional tax incidence: each of the 'sectors' becomes a region specializing in one traded good. Suppose national demand for each of the two goods is a function only of relative prices and national income, and that the income elasticity of demand is unity. Then if both factors (capital and labour) are mobile, the effect of a change in tax on capital income in Ontario could be derived by a straightforward plugging-in of the formulae derived by Harberger. It follows that such a tax must raise the relative price of Ontario's output and lower its quantity. Since both factors are perfectly mobile, the effects of Ontario policies on incomes will be national; they cannot be confined to Ontario residents. The effect of a tax on capital income in Ontario on the ratio of wages to the return on capital has two components: a substitution effect that must be positive, and an output effect that will also be positive if Ontario's output is more capital intensive than that of the rest of Canada. Thus if Ontario industry is relatively capital-intensive, any increase in the effective tax on capital in Ontario would serve to raise the wage rate nationally relative to the return on capital. But if Ontario industry is relatively less capital-intensive, this relative wage rate may fall, since the output effect has the 'wrong' sign.

This fall is more likely the smaller is the elasticity of substitution in production in Ontario, the larger is the elasticity of demand for output, and the greater is the difference between factor intensities in Ontario and the rest of Canada.[7]

Note that in addition to explicitly considering the rest of the world, the Harberger model provides a complete general equilibrium solution to the tax incidence problem. This is in contrast to the models cited earlier, which derived only the effects of migration, itself induced by (and inducing) some tax changes. Of course the model is quite restrictive. Only if the income elasticity of demand is unity can this analysis be used for changes in existing taxes, rather than merely the imposition of (small) taxes on an otherwise tax-free world.[8] The demand side and the government's budget constraints are treated rather cursorily (but I shall look at them separately below). And only two factors of production are considered.

It should be noted that most explicit applications of the Harberger model to interregional tax incidence have modified it to assume that labour is immobile between regions. Although such an assumption is at odds with the purpose of this study, it will be useful to briefly consider these applications. McLure (1969) shows that when a factor is completely immobile between regions, it is liable to bear the burden of local taxes. Thus, immobile labour in a region must bear the entire burden of a tax on labour earnings in that region. A tax on (mobile) capital income in one region must lower the return to capital in that region, raise the wage in the other region, and raise the relative price of the output produced in the tax-levying region. It will raise the wage in the tax-levying region if and only if the elasticity of substitution in the tax-levying region exceeds the (income-compensated) elasticity of demand for the tax-levying region's output.

Thus one lesson from simple two-sector models of tax incidence is that factor mobility matters. Suppose, for example, the Ontario industry is relatively capital-intensive, and that it does not have a high elasticity of substitution. Then a tax on wages in Ontario will fall on Ontario workers if labour is immobile, but on capital-owners in general if labour is mobile. Notice also that any tax increase in Ontario must raise wages outside Ontario if labour is immobile, whereas labour mobility implies that any policy change must affect all workers equally.

A 'hybrid' model analysed by McGuire (1982) may be worth mention-

ing. McGuire examines a two-factor, two-sector world in which the aggregate supply of capital is not fixed, but perfectly elastic. If the supply of capital to Canada is perfectly elastic, and labour perfectly mobile within Canada, McGuire's model can be directly applied to the incidence of a change in taxes in one region. If the output produced outside Ontario is taken as numéraire (as has been done above), a tax on capital income in Ontario must leave the relative wage unchanged (and raise the price of Ontario's output). The same result follows from an increase in the tax on labour income, since the wage rate is already determined by the (fixed) return on capital from the condition that the cost of output produced outside Ontario equal its price (of unity).

It should be emphasized that all the above results refer to prices (and wages) relative to the price of the output produced outside Ontario. To the extent that tax increases raise the relative price of Ontario's output, consumers of this output will be made worse off. But here I am concentrating on 'backward' shifting, deferring the effects on residents (and non-residents) in their role as consumers to the next section.

Extensions of the Harberger model

Although the formal analysis becomes considerably messier, the insights gained from these simple models become increasingly relevant when more than two factors of production are considered.[9] Consider a model in which two commodities are produced by two types of labour ('unskilled' and 'skilled') and by capital. Capital is internationally mobile. Labour is mobile between regions within Canada, and in fixed supply within Canada as a whole. Each region ('Ontario' and 'the rest of Canada') specializes in one output. This is simply the Harberger model with one more factor of production. As in that model, a tax on the wages of skilled labour must lower the net wage of skilled labour if Ontario's output uses relatively more skilled labour than the rest of Canada, and if the two types of labour are not very highly complementary. Since cost conditions in the rest of Canada - $c^Y(w_1, w_2, r) = 1$ - imply that exactly one net wage rate must rise and exactly one fall (relative to the price of the rest of Canada's output), the above conditions are also sufficient for the net wage of unskilled labour to rise. Thus, under 'reasonable' conditions, an increase in progressivity (i.e., an increase in the tax on skilled labour and a decrease in the tax on unskilled labour) will have effects in the desired

direction. That is, the after-tax wage on skilled labour will fall, and that on unskilled labour will rise. However, these changes will be smaller than the short-run changes. They will also hold equally for all Canadians, not just Ontario residents. And they will be weakened if labour is internationally mobile to some degree. The relative price of Ontario's ouput will rise if the ratio of skilled to unskilled labour is higher in Ontario than it is in the rest of Canada.

It should also be noted that if one type of labour is more mobile than another, then an extension of McLure's (1969) model to three factors is of some relevance. If capital is mobile internationally, skilled labour mobile within Canada, and unskilled labour immobile, then unskilled labour in Ontario must bear all of the burden of any tax levied on it. But unskilled labour elsewhere in Canada may be made better off.

Imperfect mobility

Suppose now that labour is less than perfectly mobile. That is, consider the case in which an increase in the real wage of some group in Ontario reduces migration, but not necessarily enough to equalize wages across jurisdictions. With imperfect mobility of labour but perfect mobility of commodities, complete specialization need not occur. If Ontario and the rest of Canada produce the same tradeable commodities, factor price equalization may occur. As noted above, factor price equalization fixes gross-of-tax wages. Hence the impact of changes in tax rates on net wages will be exactly the initial impact - provided Ontario continues to produce the same goods as before, and their relative prices are unchanged. With imperfect mobility, an increase in progressivity will imply an emigration of high-priced labour and immigration of low-priced labour. Ontario's output mix will shift towards products that use high-priced labour more intensively. The rest of Canada's output composition will shift in the opposite direction. High-priced workers who remain in Ontario will be worse off; low-priced workers in Ontario will be better off. Presumably the high-priced workers who emigrate will also be worse off; although escaping the higher taxes will keep their net wages up, they will have incurred the (monetary and psychological) costs of moving. But the main result of allowing for imperfect mobility is that the less mobile workers bear much of the tax incidence. Those who have high migration costs, or a strong attachment to Ontario's amenities, will suffer if they are taxed

more and benefit if they are taxed less. So mobility need not have great effects on the results of policy changes; the costs of migration certainly attenuate these effects.

Conclusions

Let me summarize the implications of mobility for the production side. Any change in factor taxes will change the cost of Ontario's output and the composition of its labour force. Changes in the cost of output may be constrained by outside conditions if Ontario is a price-taker on world markets. In such a case any factors that are immobile will bear much of the tax. If Ontario has some monopoly power in its output market, factor taxes may be exported to consumers of Ontario's outputs. Since any price increases must reduce demand, Ontario's production will fall and factors of production will move elsewhere. This 'output' effect will cause a reduction in the return to the factors used most intensively in producing Ontario's outputs, since they must be absorbed by industries whose relative demand for them is lower. It arises only when factors are mobile. When some factors are immobile, the reduction in demand for Ontario's output will lower their return, lessening the output effect. There is also a 'substitution' effect. As Ontario industry switches from more-heavily-taxed to less-heavily-taxed inputs, the relative return earned by the more-heavily-taxed inputs will tend to fall. But this effect will occur even in the absence of factor mobility.

CAPITALIZATION INTO COMMODITY PRICES

National effects

We now turn to the demand side. It has already been shown that the price of Ontario's output will increase if a tax is imposed on a factor of production used more intensively by Ontario industry. So an increase in progressivity will raise the relative price of Ontario's output if Ontario has a higher ratio of rich to poor workers than the rest of Canada. However, it was implicit in the Harberger-type models discussed above that consumption patterns did not vary by location or income class. Commodity prices had no direct effect on migration and were unaffected by migration. Nonetheless, an implication of this model should be emphasized before we

proceed. If people do vary in consumption patterns (but the assumption that aggregate demand depends only on prices is still approximately true), then an increased tax by Ontario on the income of skilled labour will disproportionately lower the welfare of people (everywhere) who have a strong taste for Ontario's output, if that output is produced by using relatively high inputs of skilled labour. Such a result is likely to continue to hold when the increased tax on skilled labour is accompanied by a tax reduction on unskilled labour.

Non-tradeable goods

Suppose now that some goods are not traded, but are consumed 'locally'. Personal services and housing are obvious examples. The existence of such goods does not mean that tax changes may affect Ontario residents and non-residents differently. As long as people are perfectly mobile, all members of a given class will be identically affected by Ontario's tax changes, regardless of their location. If prices of local goods (or the quality of life, or the quality of publicly provided output) differ between provinces, so will the wages of different classes of individuals, leaving people indifferent among all locations in which they actually locate. For instance, an increase in the tax on skilled labour would raise the price of local goods and both groups' net wage rates. The net wage increases would be proportional to the rise in the price of local goods times the group's per capita consumption of those goods, since this change would leave each group's welfare unchanged.[10] This result assumes that Ontario is 'small', so that welfare outside of Ontario is unaffected by Ontario's policy, and that local goods are produced from the two types of labour and capital by a constant-returns-to-scale production function. In such a model, the effects of an increase in progressivity are harder to predict. But a likely outcome is a rise in the price of local goods, a rise in all net wage rates, a rise in the relative gross-of-tax price of skilled labour, and a fall in the proportion of the population that is skilled (since the relative price rise affects demands for labour by firms). Of course, by assumption, no one's welfare has been changed.

Alternatively, suppose that the population can be divided into 'professionals', whose output is locally consumed, and 'non-professionals', who combine with mobile capital to produce a traded output. Then it must be true that (in a small economy) an increased tax on professional income,

coupled with a decreased tax on non-professional income, must raise the net wage of both groups and the cost of professionals' services.[11] It might actually be true that this policy change would lead to an inflow of professionals. If the reduced gross wage of non-professionals greatly increased output of the traded good, and if non-professionals had relatively high demands for local goods, their increased numbers might dominate the effect of the higher price on the demand for local goods.

Capitalization into housing prices

Most of the work on the effects of mobility on the price of locally consumed goods has been concerned with cities rather than regions. And the local good is usually assumed to be housing. What is distinct about this sort of model is that the supply of housing is not perfectly elastic. This assumption contrasts with the constant returns to scale assumed above. The cause of less-than-perfectly-elastic supply curves is that some factor is fixed in supply. Land is the obvious fixed factor in models of local housing supply. And its fixity means that (like immobile labour in McLure's model) it will bear some of the burden of tax changes.

Most analyses of capitalization concentrate on the property tax. In particular the proposition has been widely investigated (starting with Oates 1969) that differences in property tax rates between jurisdictions will be reflected entirely in differences in housing prices.[12] The theory here is simple enough. If two jurisdictions are identical, except for a lower property tax rate in one jurisdiction, then mobility of residents ensures that the annual cost of housing will be equalized between the jurisdictions. This equality then requires that the price of houses will be higher in the low-tax jurisdiction. If housing were in perfectly elastic supply, such a result could not occur. But if land is in inelastic supply, this outcome is perfectly possible. Lower taxes raise the derived demand curve for land, yielding a higher price.

The phenomenon of capitalization also applies to income taxes. If some jurisdiction's income tax rate is lower than another's, the price of housing would rise so as to equalize the real incomes of residents between jurisdictions. If residents were identical, the magnitude of this capitalization effect would be easy to calculate. If lower taxes gave residents of a given jurisdiction after-tax incomes x per cent higher than incomes elsewhere, housing prices would be (x/k) per cent higher there, where k is

the proportion of income spent on housing. Since the change in housing prices would all be due to higher land prices, the effect on land prices could be quite large: a reduction in the tax rate from 25 per cent to 20 per cent could more than double land prices. However, this capitalization effect depends on the individual. Capitalization of the property tax does not; it obeys $dv/v = - dt/(t + r)$, where v is the value of a house, t the property tax rate, and r the interest rate.[13] Since the right-hand side of this equation is the same for all people, all property values increase by the same proportion. The income tax effect can be written $dv/v = (dy/y)/(ph/y)$, where y is the after-tax income and $ph/y(= k)$ is the proportion of income spent on housing.[14] Hence the capitalization of the income tax into property values depends both on how much the resident's after-tax income has increased and on the proportion of income spent on housing. In the long run, housing goes to the highest bidder. Thus only that class of individual for whom $(dy/y)/(vh/y)$ is highest will occupy that jurisdiction.[15]

Capitalization and stratification by income

The above argument suggests that differences between local tax policies may lead to segregation by income class among jurisdictions. Although such segregation seems absurd in a provincial setting, it is not wildly inconsistent with location patterns within American metropolitan areas. And it is a natural implication of the Tiebout hypothesis, as is shown by Ellickson (1971), McGuire (1974), Henderson (1977), and Bucovetsky (1981), when individuals vary by income, but not in underlying tastes. Goldstein and Pauly (1981) show that variations in tastes as well as income will imply income heterogeneity within jurisdictions.

Does capitalization then imply that an increase in progressivity (or any policy at variance with one's neighbours' policies) will lead to only one income class' living in a jurisdiction? One facet of urban land markets left out of the analysis so far is accessibility. Since land prices vary by location within a given jurisdiction, there will be in general only one income class bidding for land at each location, but many classes within the jurisdiction. Haurin (1981) shows the effect of a municipal income tax in such a city. If we assume that higher-income residents live further from downtown (this is a 'stylized fact' in urban economics; it is explained in Wheaton 1977), a progressive income tax results in lower-income residents'

bidding some land away from higher-income residents on the border of the two groups. The overall results of the tax in Haurin's model (actually a numerical simulation due to the complexity of the analysis) is that the city that raises taxes has fewer residents and a higher proportion of low-income residents than the city that does not. Land prices in the tax-raising city actually fall, since the tax lowers the income of richer residents, who determine the land price at the margin. Haurin's model also involves a production sector, which will not be discussed here. The point he emphasizes is that a city can increase the progressivity of its income tax without driving out all rich residents.

Of course provinces are not cities. There are many good reasons why income segregation does not occur among provinces. For instance, there is the production side. If factor price equalization does not occur, the wages of relatively scarce groups will be bid up, due to diminishing rates of substitution in production. However, capitalization still should occur. Although Ontario has a large supply of undeveloped land, there is a limited amount of land with certain amenities, such as accessibility to urban centres or recreational lakes. Any policy that attracts immigration should be partially capitalized in land values. For instance, it is widely argued that Alberta's attraction of new residents as a result of its resource revenues is capitalized to some degree in higher land prices (see McMillan and Norrie 1980, Courchene and Dowd 1983). Free land near Lake Athabasca is irrelevant to a prospective migrant who wishes to live near Calgary.

Conclusions

Most of the policy changes that would stem from Ontario's adopting its own PIT would be likely to make the province more attractive for some residents and less attractive for others. For instance, an increase in progressivity would attract low-income residents and repel high-income residents, given that the effects on production considered above are taken into account. In the short run, this increased progressivity might drive up the price of low-income housing and reduce the price of high-income housing, thus attenuating both migration flows. But in the time horizon relevant to migration decisions, the composition of the housing stock can be altered. Thus, the effect on land prices would depend on whether new immigrants' housing demand exceeded emigrants' demand. If the numbers

migrating in each direction were about equal, then a decline in land prices would be expected, since higher-income people demand more housing per capita. But there is no reason to suppose the number of emigrants would equal the number of immigrants. If low-income workers are less mobile (there seems to some evidence for this - see Greenwood 1975, Section 5), then increasing tax progressivity might lower population, definitely causing land prices to fall.

What may be more important is the capitalization of policy changes into the prices of goods that are consumed disproportionately by different groups. Any luxuries produced under conditions of less-than-perfect elasticity should fall in price if Ontario's tax became more progressive. Presumably tax exemption of unemployment benefits would raise housing prices in Windsor and Cornwall, and more lenient treatment of investment income would raise them in Oakville and Rosedale. But it is probably reasonable to conclude that changes in the structure of Ontario's income tax would not have major effects on land prices. And these capitalization effects would not affect migration much.

A possible exception to this rule would be policies directed at housing itself. The capitalization discussed so far has little to do with housing per se. If some policy makes Ontario more attractive, and a house in Ontario is an admission ticket to those attractions, the ticket price rises. But specific housing policies, such as tax deductibility of mortgage interest and/or property taxes, would increase the demand of existing residents. Moreover, they would attract to Ontario people with large housing demands, such as high-income people and people with large families. Housing prices might rise greatly, making worse off those who got little benefit from the preferences (i.e., renters, or those in low-tax brackets). Some of them might then emigrate.[16] But certainly the effect on housing prices of changing demand by current residents would dwarf the effect of migration.

THE GOVERNMENT BUDGET CONSTRAINT

Defining 'equal yield' policies

So far very little attention has been paid to the government's budget constraint. The effects of tax increases have been analysed with very little reference to what is done with the revenues. The simplest Har-

berger-type models have assumed that tax revenue is redistributed in lump-sum fashion to residents. In fact, given the homothetic demands, the analysis is not affected by who gets the revenue. Alternatively, the government may spend the tax revenue, but the government then has the same 'demand' patterns as private citizens. Homma (1977), Diamond (1978), and others have modified this demand side, but still in the context of the effect of a change in one tax rate.

I referred earlier to the effects of an increase in tax progressivity. By that I meant some change in the tax structure that raises tax rates at high levels of income, lowers them at low levels, and presumably maintains the previous revenue. For only when revenue yield is unchanged can the effects of tax changes be isolated from the effects of what the government does with the tax revenue. What is required is 'differential tax incidence', and in this section I consider what constraints the requirement of 'equal yield' places on tax changes in a model with mobility.

If the population were fixed, this requirement would be simple enough. Given two groups of people, the equal yield condition holds if and only if the per capita increase in taxes levied on one group, times its population, equals the per capita decrease in taxes levied on the other group, times its population. Of course, when hours worked are endogenous, the actual per capita tax paid will itself be some function of tax rates. But the constraint on the tax system seems simple enough.

When the population may vary, some difficulties ensue. First of all, there is the expenditure side. Does 'equal yield' imply constant total tax revenue, constant per capita tax revenue, or something in between? Since the reason for considering equal yield changes is to leave unchanged the level of public sector output available to a prospective migrant, the relevant question is how the cost of the public sector varies with population. Here I will assume that this cost is proportional to the population. That is, the cost of extending a given level of public output to P more people is cP dollars, where c is a constant representing the level of output provided. Under this assumption, 'equal yield' means 'equal per capita yield', since the province's budget constraint is that taxes collected per capita equal expenditure per capita.

Briefly, it should be noted that the opposite assumption, that the costs of the local public sector do not depend on population, has been central to much of the literature on the theory of fiscal federalism. Some of this literature is summarized in Atkinson and Stiglitz (1980, ch. 17).

Under this assumption, migration brings an advantage - lower per capita cost of the public sector - in addition to the disadvantage of higher land prices (or lower wages if there is a scarce immobile factor involved in production). Although this literature provides much insight into the potential inefficiency of mobility in a federal system, the assumption about the costs of the public sector seems manifestly unrealistic. Recent work - for example, Boadway and Flatters (n.d.) and Haurin (1981) - has assumed the 'private good' technology for output that I am adopting.

Mobility makes income redistribution difficult

The provincial government's revenue constraint in a two-class model can now be written $t_1L_1 + t_2L_2 = c(L_1 + L_2)$, where t_i is the per capita tax collected from class i, L_i the number of people of class i, and c the per capita cost of the public sector. It is immediately apparent that if $t_2 > t_1$, the local public sector is making money on group 2 and losing it on group 1, in the sense that group 2 (1) members pay more (less) in tax revenue than it costs to provide them with public output. Thus any influx of group 2 (1) members raises (lowers) the provincial surplus, enabling all taxes to be lowered (raised) without affecting the quality of public output. It is basically this simple fact that underlies the strongest argument against redistribution by lower levels of government.

This argument is a standard 'textbook' one, which does not mean it is not valid. Stigler (1957) and Oates (1972) are frequently cited expositions. Suppose that all jurisdictions have the same tax structure, local public output, and distribution of population between income classes. Suppose now that Ontario tries to increase progressivity by raising its tax on the rich to t_2' and lowering its tax on the poor to t_1'. It expects the equal yield condition to hold, since $t_1' L_1 + t_2' L_2 = c(L_1 + L_2)$, where L_1 and L_2 are Ontario's current (before the change) populations of the two groups. Rational citizens of class 2 will all leave Ontario, since they will pay lower taxes elsewhere, and citizens of class 1 will flock to Ontario. Since now $L_2 = 0$, this migration will have completely thwarted any attempted increase in progressivity. Usher (1980, 18-19) concludes that

> it is difficult to say whether the resulting equilibrium, if there is one at all, would be such as to eliminate the redistributive activity altogether. That would seem to depend on the propensities of the rich and poor to migrate, the extent of altruism, the degree to which altruism is specific to one's neighbourhood or ethnic group and the proportions of

incomes in the different provinces attributable to immovable factors of production. What seems fairly certain is that there would be less redistribution in total under provincial than under federal jurisdiction.

Feasible tax changes under mobility

Although the factors listed by Usher do seem to mitigate some of the problems associated with income redistribution at the local level, the force of the argument is valid. Formally, we can differentiate the local budget equation, to examine what change in t_1 is feasible when t_2 is raised. Let ε_{ij} represent the elasticity of population of type i to a change in tax rate j. This elasticity takes account of all the supply- and demand-side effects discussed above. In other words, if we take the economy of Ontario, raise the tax rate on group j, and do nothing with the proceeds, a new equilibrium will result, with different wages, population composition, output prices, etc. The elasticity ε_{ij} represents the proportional change in the population in group i after such a tax change. The most reasonable conclusion from the above survey of the literature is that $\varepsilon_{ii} < 0$. The effect on other groups, ε_{ij}, is less obvious, but it is likely to be negative, and more likely to be relatively small in sign. Differentiating the budget constraint yields $(t_1 - c)dL_1 + L_1dt_1 + (t_2 - c)dL_2 + L_2dt_2 = 0$. Using the above elasticity notation, then

$$\frac{dt_1}{dt_2} = -\frac{L_2}{L_1}\,\frac{1 + \varepsilon_{22}\left(1 - \frac{c}{t_2}\right) + \varepsilon_{12}\,\frac{L_1}{L_2}\,\frac{t_1 - c}{t_2 - c}}{1 + \varepsilon_{11}\left(1 - \frac{c}{t_1}\right) + \varepsilon_{21}\,\frac{L_2}{L_1}\,\frac{t_2 - c}{t_1 - c}}\,.$$

Given that group 1 is the less-taxed group, the denominator is positive if all the elasticities are negative. The more responsive is migration t tax rates (the higher in absolute value is ε_{11}), the bigger is the denominator. High rates of redistribution to the low-income group (t_1 much less than c) also make the denominator bigger. The numerator may be negative or positive. If the mobility of the rich is responsive enough, or if the tax system is redistributive enough, the term $\varepsilon_{22}(1 - c/t_2)$ may dominate the others, so that $dt_1/dt_2 > 0$. This, of course, is the 'elimination of redistribution' result mentioned by Usher. Even if we have $dt_1/dt_2 < 0$, so that it is possible to do more redistribution, the more responsive is mobili-

ty, and the greater the amount of redistribution currently undertaken, the smaller will be dt_1/dt_2 in absolute value.

What the above expression formalizes is the intuitive notion that the more mobile is society, the greater is the cost to the rich of redistribution to the poor. This formula can also be used to examine Pauly's (1973) argument in favour of redistribution at the sub-national level. He argues that redistribution is a good like any other; the rich have a 'taste' for making the poor better off. Moreover, this taste extends only to the poor in their jurisdiction, or at least it extends disproportionately to them. (It may be based on rational self-interest, since the rich may attribute externalities such as crime and disease to nearby low-income neighbourhoods.) Hence redistribution by local or provincial governments may be higher than redistribution by federal governments, since voters have a greater taste for redistribution to those nearby. The formula above can be seen to represent the inverse of the cost of redistribution to the rich. Hence the more open is an economy and the more mobile its citizenry, the greater is the cost of redistribution.

It also should be noted that redistribution by one jurisdiction yields benefits to other jurisdictions. By importing other jurisdictions' low-income residents and exporting its own high-income residents, Ontario enables other jursidictions to lower their own taxes. Note also that if Canada's equalization system were self-financing (so that have-not provinces received equalization directly from have provinces), the effects of mobility would be mitigated. Ontario would receive increased equalization to compensate for the lower per capita tax base. Under the current actual equalization scheme, no such automatic offset exists. Increased immigration of low-income residents from the Atlantic provinces induced by more progression in Ontario taxes might lower total equalization payments, making Ontarians better off. But a similar change in migration from the west would have the opposite effect.

Optimal redistribution with mobility

Most of the literature on redistribution and mobility concentrates on the level of government to which the redistributive function should optimally be assigned in a federal state. But a more appropriate question, given that Ontario has little influence on other governments' policies, might be how much a province should redistribute, given the mobility response such

redistribution induces. Recent papers by Wilson (1980, 1982) and Bhagwati and Hamada (1982) look at this question. Wilson examines a jurisdiction levying a linear income tax with an exemption. Thus the higher is the rate (and the exemption), the more progressive is the tax. Policymakers are assumed to maximize some welfare function dependent on all residents' utility, whether or not they emigrate in response to the tax imposed.[17] The question is whether their choice of tax will be more progressive when mobility is allowed than when it is not. The answer, surprisingly enough, is that 'it depends', at least at the level of generality of Wilson (1980). The reason is that when there are more than two types of individual, tax rate increases may attract some people whose taxes exceed the costs of their public output consumption or repel some people for which the opposite holds. That is, I may be a net gainer from the tax system, but an increase in progressivity may make me worse off. Thus such a tax increase, if it induces me to leave, will leave all remaining residents with a surplus to divide. Hence my mobility makes a more progressive tax rate more attractive.

Wilson (1980) does show that if mobility occurs only among the very high-income or the very low-income residents, then mobility implies a less progressive tax system. This result corresponds to the two-class example presented above. The less general models of Wilson (1982) and Bhagwati and Hamada (1982) obtain similar conclusions. This brief précis has ignored some of the analytic sophistication of these papers (for instance, their explicit consideration of the labour-leisure choice of residents) and some of their difficulties as well. But the conclusions they obtain seem relevant. If residents are mobile, the costs of redistribution are high. Only if Ontario policymakers had much more egalitarian tastes than their federal counterparts would increased progression in the PIT be justified. However, the opposite conclusion (that Ontario should run its own PIT to decrease progressivity) is not terribly compelling. This is a sort of 'beggar-thy-neighbour' policy. If followed by other provinces, it would lead to a lower overall level of redistribution than might be considered optimal for Canada.

Differences in mobility

One interesting feature of Wilson (1980) is that it allows otherwise identical people to differ in mobility. These differences could represent moving

costs, or attachment to the home jurisdiction. They explain why, even in a very simple model, elasticities of mobility may vary. One can arrange people (of a given income class) by the magnitude of real income differential between Ontario and the rest of the world that it takes to induce them to emigrate. A decrease in the real income attainable in Ontario of the class y to y' would induce all those whose maximum tolerable real income differential is between $\bar{y}$ - y and $\bar{y}$ - y' to leave, where $\bar{y}$ is the real income attainable elsewhere.

The higher is one's maximum tolerable income differential, the greater is the potential loss one can suffer from changes in Ontario tax policy, assuming that conditions elsewhere are unaffected. This suggests that any redistribution in a small, open economy must be at the expense of immobile groups. Returning to my equation for dt_1/dt_2, if some group 3 is less mobile than group 2, $dt_1/dt_3 > dt_1/dt_2$; thus it pays group 1 to levy higher taxes on 3. What such an argument may imply is that increasing a provincial role in distributional decisions will lead to increasing 'exploitation' of some immobile groups. If, for instance, provincial control over the PIT were to lead to more subsidies to low-income residents, then it would do this at the expense of the more immobile high-income residents, such as older ones. Who else is there to exploit (at least within the income tax system)?

Exit versus voice

That the view just stated may be seriously misleading is the main thesis of Hirschman (1970).[18] He refers to mobility as 'exit' and notes 'the economist's bias in favour of exit and against voice.' By 'voice' he means such activities as political lobbying. He argues (ch. 6) that it is the immobile who have the voice. Since they stand to suffer most from provincial government policy, they have the most interest in expending time, energy, and money on trying to influence that policy. Thus my presumption that the PIT will be a mechanism for low-income groups to gain at the expense of immobile high-income groups is wrong. All immobile groups (old people, farmers, francophones in Quebec) will try to use provincial policy for their own gains. There is a feasibility problem here. If all immobile groups succeed in this effort, who is left to be exploited? The mobile, who have little interest in influencing provincial policy, since they can escape its effects, will do just that. Thus the attempts by the immobile groups to

unilaterally gain at mobile groups' expense cannot succeed.

It should be noted here that all immobile groups are not identical. An excellent analysis of the returns to political influence in an open economy is provided by Migué (1979). He examines nationalistic policies pursued by the Canadian and Quebec governments. Although such policies are ostensibly designed to exploit foreigners (such as suppliers of capital), the mobility of foreigners stymies such exploitation. Migué concludes (1979, 68) that 'the victims are, in general, groups composed of large numbers of citizens while the beneficiaries are small groups of factor-holders.' Hence, one set of immobile groups gains at the expense of other immobile groups whose members' individual costs from nationalistic policies are too small and diffusely distributed to justify political action. Although such analysis of the economics of political action is an important and fast-growing area within the discipline, further consideration of such matters will not be pursued here.

The fact that it is impossible for a province's immobile groups to gain from the mobile groups doesn't mean they don't try. Hirschman describes Barry Goldwater's 1964 nomination as an attempt by immobile (right-wing) Republicans to exploit mobile (middle-of-the-road) Republicans that merely resulted in the mobile group's voting Democrat. Quebec's policies towards rich anglophones and the Foreign Investment Review Agency may be Canadian examples of this sort of attempt. If Ontario's takeover of the PIT led to such behaviour, the mobile groups that the province sought to exploit would simply move on. As Wilson notes, whether this movement would better or worsen the lot of those left behind would depend on whether the provincial treasury were previously making or losing money on the mobile groups. The former seems more likely. However, what cannot be accomplished unilaterally may be accomplished 'collectively'. If immobile groups in all provinces attempted to imitate Ontario, there would be nowhere (in Canada) for the mobile to hide. In other words, one province's attempt to exploit mobile groups confers a positive externality on immobile groups in other provinces. The main beneficiaries of Ontario's making its PIT more progressive might be francophones in Quebec.

Such an externality may also suggest that provinces cooperate in setting tax policy. This cooperation would presumably benefit each province's immobile policymakers at the expense of all of Canada's more mobile groups. Hence it is by no means clear that cooperation between provinces is to be encouraged and competition decried. For an attempt to predict

the implications of such cooperation and competition for various groups, in the context of a federal state, see Bucovetsky (1983). Since the focus here is on Ontario's unilaterally imposing its own PIT, I am concentrating on non-cooperative behaviour among provinces.

If other provinces attempted to imitate Ontario, the immobile might succeed in exploiting the mobile. Note that this 'imitation' would not be 'retaliation'; Ontario's initial (assumed) increased progression would make other provinces better off. Imitation would be the result of political 'voice', rather than a 'rational' economic response. If one province attempts to exploit mobile groups, the economic incentive for other provinces not to do so becomes stronger. Thus whether the 'exit' option succeeds depends on whether increased returns to paying attention to the economic consequences eventually overcome the vocal power of pressure groups. In summary, economists' 'exit' considerations predict that widespread provincial control of the PIT would lead to losses in real income by immobile high-income residents. Political scientists' 'voice' considerations suggest losses by mobile (within Canada) groups to those who are immobile. And the more pronounced are these 'voice' effects, the greater are the economic returns to a province not listening. Finally, note that if mobile groups are mobile internationally as well, then the efforts of the provincially immobile will be stymied, unless foreign governments pursue similar policies.

EMPIRICAL WORK ON MIGRATION

What determines migration?

There has been no shortage of empirical work on the determinants of migration. Greenwood's (1975) survey of the literature on American internal migration cites 251 references. And there is a corresponding volume of Canadian studies. Most of these studies do not concern themselves directly with the effects of interregional variations in personal income tax rate structure on mobility. But it takes only a small leap of faith to draw some inferences from their conclusions concerning other income variables. A rational migrant should not care whether the higher net wage rate in some jurisdiction is due to higher gross wage rates or lower income tax rates, provided there is no difference in his perception of the likely persistence of such differentials. A change in the provincial

tax structure should be perceived as reasonably permanent, and as at least as likely to induce migration as equivalent changes in average pre-tax income in a province, which may be seen as transitory.

It also seems reasonable to suppose, when one uses regional income (or wage) variables as regressors in migration equation, that these variables be net of income tax. This is not the case in most studies, presumably because of difficulties in data gathering. I would not argue that all taxes should be treated in this way. The impact of (say) property tax differentials depends on one's demand for housing. A fortiori, differences in public expenditures should be kept separate from net income tax changes. A dollar reduction in one's income tax liabilities should be worth one dollar. But the value of an increase of one dollar in public expenditure depends on one's demand for the public goods purchased. In particular, if public goods are normal goods, the value placed on a given public expenditure differential should be an increasing function of the potential migrant's income. However, many studies of migration that have concentrated on fiscal variables have aggregated these variables in the ways just decried. Often some variable representing 'net fiscal benefits', which is some measure of public expenditure per capita minus average tax paid by that income class, is included on the right-hand side. Again, practical difficulties with data, and worries about multicollinearity, appear to motivate much of this misspecification.

Most studies of migration start with the rather reasonable hypothesis that people locate so as to maximize their utility. Other things being equal, this hypothesis certainly suggests migration moves in the direction of positive wage differentials. The problem is that other things are not equal. Greenwood (1975, 411) concludes that

> if the notion of wage differences is interpreted narrowly as money-wage differentials (or even as money-wage differentials corrected for cost-of-living differences) Hicks's contention that wage differences are the chief determinant of migration has not been confirmed. If the notion of wage differences is interpreted in its broadest sense as real wage (actually real income)...then the empirical evidence for Hicks's claim is more favorable. However the meaningfulness of such a broad definition is questionable.

Indeed, much of the work on migration can be viewed as attempts to manipulate recalcitrant data to confirm hypotheses that seem eminently innocuous and reasonable on a priori theoretical grounds. What are probably of more relevance to this study are conclusions on how responsive

migration is to income differentials, and how this responsiveness varies by income class.

Some empirical studies

Courchene (1970) is a pioneering work on migration within Canada. It confirms the hypotheses that migration responds positively to income differences, that it responds negatively to distance, and that these responses are stronger for younger and better-educated people. Courchene's results indicate that the elasticities of gross migration flows with respect to income differentials are in the range of 6 to 9. These elasticities are the percentage change in the migration from province i to province j by a group in response to a 1 per cent increase in real income in province j and a 1 per cent decrease in income in province i. These elasticities may appear high. But migration flows are a very small percentage of the population. The sum of gross immigration and emigration in Ontario over the five years 1956-61 was less than 120,000. On the other hand, the elasticities refer to annual flows. Thus a permanent change in relative incomes between provinces would induce more migration each year. In the long run, such migration may have a large cumulative effect. But Courchene's estimates indicate that the long run may be far away.

Courchene (1974) again supports the hypothesis that migration flows can be explained by economic factors. No elasticities are computed here, but Courchene does conclude that the propensity to migrate may be higher for low-income groups. However, the return to migration appears to decline with migrants' pre-migration income. If one accepts the hypothesis that migration proceeds up to the point where marginal benefits of the move equal marginal costs, this pattern indicates that the costs of migration may be higher for low-income groups. Of course, gross income differentials may be less important to low-income than probability of employment and generosity of transfer programs.

Let me turn now to some recent American work. Cebula (1979a, b, 1980) has examined migration with particular emphasis on state and local fiscal policies. The particular policy that has commanded the most interest in the United States is welfare. Much attention has been given to the popular hypothesis that the black migration from the rural south to the urban north has been in large part a response to the more liberal welfare provisions in the northern states. In general, empirical work supports

this hypothesis. It also concludes that welfare differentials have a greater impact on black migration than on white migration, which is certainly consistent with the observation that welfare is a relatively more important source of income to blacks than to whites. Cebula does however discuss some work on the impact of state and local taxes on migration. Cebula (1974a, b), Pack (1973), and Kumar (1977) have all found such an impact, although property taxes have been their main concern. Liu (1977) found no such impact, due perhaps to collinearity of his tax variable and per capita public expenditure. One might expect difficulties in ascertaining the impact of income tax differentials from American data, since the role of the income tax varies so much from state to state.

Grieson and his co-authors (1977, 1980) have done some analysis of the impact of local income taxation. He finds relatively high effects on employment from the local income tax. The elasticity of employment with respect to the local income tax rate was estimated at -0.36 for Philadelphia and -0.35 for New York. These elasticities refer to the overall effect - when capitalization, composition of output effects, and all other adjustments have taken place. Also, the tax revenue is not assumed to yield any benefits. Of course, one expects higher elasticities for the central city of a metropolitan area than for a province.

Following the initial work of Courchene (1970, 1974) and Vanderkamp (1968, 1971), there has been a more recent wave of empirical work on migration in Canada. Much of this work has been concerned with the relation between migration and government policy, particularly the role of intergovernmental grants. However, the use of gross-of-tax rather than net-of-tax wage rates as explanatory variables has persisted. This is a pity, given the variation in provincial tax rates within Canada. For a taxable income of $20,000, Canadian Tax Foundation (1982, 73) figures show total (provincial plus federal) tax liabilities ranging from $2,804 in Alberta to $3,608 in Quebec, a variation of 4 per cent of gross income (the variation is 2 per cent for an income of $10,000 and 10 per cent for an income of $100,000).

Robinson and Tomes (1982) are mostly concerned with the econometric problem of selectivity bias in the estimation of migration equations. The fact that only those whose returns to migration are highest are actually observed to migrate will bias downward estimates of the influence of wage differentials on migration. Correcting for this bias confirms the conclusion that migration is strongly influenced by (gross) wage differences. Robin-

son and Tomes (1982, 29) interpret their results as showing that relatively small wage differences between provinces are enough to justify migration in the context of the human capital model, in which migrants' location decisions are hypothesized to result from a decision to maximize discounted lifetime earnings. They conclude (1982, 29) that their study 'represents impressive evidence in favour of the human capital model' (which is really just the economist's conventional rationality assumption, and has been implicit in much of my analysis). They also note that among anglophones mobility increases with education and decreases with age and family size. However, mobility decreases with education among Quebec francophones. And mobility is lower, ceteris paribus, among Quebec francophones, especially those who have no knowledge of English. While not surprising, these conclusions may be of some relevance to the 'exit/ voice' considerations mentioned above, and to Quebec's experience with its own PIT.

Foot and Milne (1981) are mainly concerned with the impact of public policy on migration. However, the public policy variable they use measures provincial government expenditure plus federal government transfers to individuals in the province. Since the wage variable is gross of tax, this approach leaves no explicit role for provincial tax policy (although a footnote indicates that Foot and Milne have undertaken some preliminary investigations that do take provincial tax policy into account). Nonetheless, this study confirms yet again that interprovincial migration is quite sensitive to wage differences and to differences in public output. Thus it may be wise to expect (at least some) migrants to respond in an informed, rational way to tax differences, at least until evidence to the contrary is forthcoming. For instance, Foot and Milne's results (Table 4, 24) show that a 1 per cent increase in Ontario's real wage would raise annual net immigration by 3,800 people per year, almost enough to reverse the net interprovincial migration flow out of Ontario. While such inferences seem most directly relevant to tax changes that affect the average net wage, rather than its variation among different income classes, they do show that the potential effect of provincial taxes on interprovincial mobility may be too big to be ignored.

The study most concerned with government policy (and by far the largest study) is Winer and Gauthier (1981). This is a massive effort, one that devotes a great amount of attention to the appropriate measure of the net fiscal benefits accruing to a prospective migrant to a province. Nonetheless, wages are included gross of PIT. Winer and Gauthier (1981,

160-61) note that 'personal [provincial] tax liabilities are determined by income. Hence the effect of TX_k [the provincial income tax rate] on migration will be included in the coefficient of Y_k [gross income].' While this comment is true, it is also true that any differences between provinces or income classes on the coefficient of the income term will be some combination of a different migration tendency and a different (implicit) provincial tax rate difference. There is certainly a wide variation in the estimated responsiveness of migration to income differences among provinces and income classes. Unfortunately, PIT differences do not explain these variations too neatly. Members of the highest income group are more likely to move in response to a given gross income difference than those of lower income. This conclusion does not support the notion that it is net-of-tax income that matters, if the tax structure is assumed to be progressive. But it is true that high-income migrants to Alberta and British Columbia are more sensitive to the gross wage than those with other destinations. This result can be partially explained by those provinces' lower provincial income tax rates.

Like the authors of most of the other studies I have cited, Winer and Gauthier confirm that migration responds positively (and significantly) to gross income differences. Also, differences in public expenditures have, in general, the predicted effect. This effect does vary. 'Fiscal structure generally influences the poor and middle income class more than it does the rich' and 'appears to be more important in determining gross out-migration from the Atlantic provinces and gross in-migration to Alberta/British Columbia than it is in determining gross flows ... in the opposite direction' (1981, 203). Given the sources and destinations of Ontario's immigrants and emigrants, the second statement appears to support the view that fiscal policy has on migration to and from the province. One should not draw from the first statement inferences concerning tax policy. Since public expenditure (especially those programs considered in detail by Winer and Gauthier) confer their benefits mainly on lower-income residents, it should be expected to influence their migration decision more. One should not expect the rich to be so unresponsive to tax differences.

CONCLUSIONS

If there is one main conclusion to be drawn from this report, it is that mobility severely limits a province's ability to redistribute income among its

residents. Of course, such a conclusion assumes an elastic response of migration to tax differences - an assumption for which the previous section provided little specific evidence. However, the literature on migration appears to strongly support the notion that people will move in response to real income differences about which they are informed, and which are expected to persist long enough to justify moving costs. A difference in provincial tax policy should have these characteristics. Newspaper stories on mass exoduses of professionals inspired by tax policy changes (such as those proposed in the ill-fated November 1981 budget) indicate that the public is aware of such differences, whether or not the stories are true. I would suggest that public perception of Alberta's low tax rates is quite high. Similarly, tax differences between provinces (or states, in the United States) appear to persist. A major shift in Ontario's tax structure might well be perceived as long-lasting. I would, therefore, argue that major changes in the PIT would affect migration strongly.

Of course, more direct empirical verification of this conjecture would be very useful. As I have said, there are some data on city income taxes in the United States. But one would expect a greater mobility response to municipal than to provincial taxes, since there may be many alternative jurisdictions within the same metropolitan area. It is much harder to draw inferences from provincial data, since there are so many variables and so few observations. Thus it is hard to disentangle the causes of emigration from Quebec, to which the province's higher and more progressive PIT, its declining manufacturing industries, and English fears of French-Canadian nationalism all seem to contribute. Nonetheless, Quebec's experience does seem to offer some weak and anecdotal evidence in favour of there being a large response to PIT differences.

What, then, are the consequences of mobility? An obvious one is that provincial attempts at redistribution may be stymied. Conversely, there is a strong incentive for provincial governments to attract high-income residents through less progressive tax structures. But any attempt by Ontario to do this might encourage other provinces, anxious to preserve their tax bases, to reply in kind (although equalization would reduce have-not provinces' incentives to do so). Thus the overall progression of Canada's tax system might be significantly reduced by Ontario's starting the ball rolling by implementing a less progressive PIT. This possibility may provide a justification for an independent PIT for those who feel the federal government attempts too much redistribution.

However, the 'exit-voice' argument raised earlier suggests that a provincial PIT could be used by immobile groups with the greatest vested interest to attempt to exploit the more mobile. Unilateral attempts by Ontario could not succeed at this. But imitation by other provinces might lead to a change in the redistributive pattern of Canadian taxes. Given the influence that immobile groups already have on provincial policy, and given the resources used in lobbying by these groups, such a result would be both inequitable and inefficient.

Another important conclusion is that, since Ontario is a large part of Canada, and since international mobility of some people and goods may be low, Ontario's tax policy can have national effects. Thus a reduction by Ontario of the effective tax on some income class might make that class better off - but it might make it better off everywhere in Canada, not just in Ontario. Standard tax incidence theory indicates that an Ontario PIT could affect factor prices, the distribution of production among regions, and the price of Ontario's output. For instance, given that Ontario's manufacturing industry is relatively skilled-labour-intensive, a reduction by Ontario in the effective tax on skilled labour in manufacturing would expand manufacturing in Ontario. It would also raise the net return to skilled workers everywhere in Canada. It would also lower the price of Ontario's output to all its consumers - in Ontario and elsewhere. And, of course, a reduction in one effective tax rate would presumably have to be made up elsewhere. Thus, although under some conditions a separate PIT can be used as an industrial policy instrument, many Ontario residents would be worse off under such a policy. Similarly, a reduction in the effective tax on the return to capital might attract capital to Ontario. This might make some workers better off - depending on the substitution elasticities discussed in Appendix 1. But again these effects would be national. And the main beneficiaries would be capital owners everywhere.

Of course, these points do not apply only to a provincial PIT. The scope of any provincial policy may be severely limited by mobility. It may be argued that, given the difficulties inherent in implementing redistribution at the provincial level, it is better to promote redistribution directly through the PIT than to rely upon a hodgepodge of expenditure instruments. For instance, extending provincial sales taxes to necessities has reduced the progressivity of the overall tax system. Such a reduction might be better accomplished through a decreased exemption under the PIT.

Again, nominally redistributive provincial policies are often expedited by housing subsidies. The benefits of such policies are often capitalized. Even insofar as they do redistribute to consumers of Ontario housing services, and are perceived to persist, their redistributive effects, like the effects of any tax policy, will be weakened by migration. Of course, it can be argued that policymakers are aware of capitalization, and that landowners and construction unions are the intended beneficiaries of such policies. It was suggested earlier in this paper that changes in the tax structure are unlikely to have major capitalization effects. It is a matter of conjecture whether this conclusion means that a separate PIT would involve less capitalization or more intense and creative lobbying to manipulate it into a form more amenable to capitalization.

The tentative (and sometimes contradictory) nature of these conclusions indicate that more research is necessary in this area. I have pointed out the usefulness of better estimates of the long-run effects of tax policy on migration. But such estimates are likely to be difficult, if not impossible, to obtain. The second and third sections of the paper indicated the importance of data on the aggregate elasticities of substitution in production, and on the substitution of Ontario output for other goods. A less aggregative approach might be a more fruitful one. Instead of treating a province as a single-output firm, one could explicitly consider several commodities being produced. This is the approach used in applied general equilibrium.[19] By abandoning analytic manipulation in favour of numerical simulation, such models can achieve more detailed, realistic results. Of course, the price of this detail is a great deal of data. And the plausibility of the results depends on the plausibility of the data. But this would certainly be one approach to reducing some of the uncertainties concerning the effects of provincial tax policy.

APPENDIX 1
TAX INCIDENCE AND MOBILITY IN THREE-FACTOR MODELS

This appendix derives some of the theoretical results cited in the second section of the text. It draws on Diewert (1971), Epstein (1974), Berndt and Christensen (1974), Yohe (1979), and Atkinson and Stiglitz (1980), although I could find in the literature no explicit derivations of some of

the results obtained here.

Consider an economy that produces a single output by a constant-returns-to-scale production function using three inputs: skilled labour, unskilled labour, and capital. Let the subscripts 1, 2, and k refer respectively to unskilled labour, skilled labour, and capital. The production can be written

$$Y = f(L_1, L_2, k), \tag{1}$$

where Y is total output, L_i total employment of labour type i, and k the total stock of capital employed. If w_i represents the pre-tax wage of labour type i and r the return to capital, then the unit cost function $c(w_1, w_2, r)$ is the minimum cost of producing one unit of output for the given price of inputs. Constant returns to scale imply that this minimum is independent of the scale of output. Shepherd's Lemma states

$$c_1 = \frac{L_1}{Y}, \quad c_2 = \frac{L_2}{Y}, \quad \text{and } c_r = \frac{k}{Y},$$

where c_i refers to the partial derivative with respect to wage rate i and c_r to the partial derivative with respect to the return to capital.

If p is the unit price of output, then under competition

$$p = c(w_1, w_2, r). \tag{2}$$

If Ontario is a price-taker on output markets, p cannot change in response to any Ontario policy change. Thus

$$c_1 dw_1 + c_2 dw_2 + c_r dr = 0. \tag{3}$$

Using Shepherd's Lemma, and denoting by $\hat{x}$ the proportional change in a variable (i.e., $\hat{x} = dx/x$) and by α_i the share of factor i in factor payments (i.e., $\alpha_i = w_i L_i / pY$),

$$\alpha_1\hat{w}_1 + \alpha_2\hat{w}_2 + \alpha_k\hat{r} = 0. \qquad (4)$$

Before we proceed, some further notation is necessary. Generalizing the lasticity of substitution between two factors to the three-factor case is he Allen-Uzawa elasticity of substitution (henceforth AES), defined as the roportional change in the demand for factor i in response to a change in he price of factor j, holding constant the price of the third factor. pecifically,

$$\sigma_{12} = \frac{pY}{L_1L_2}\,\frac{\delta L_1}{\delta w_2}, \qquad (5)$$

where σ_{ij} represents the AES. In terms of the cost function,

$$\sigma_{ij} = \frac{pc_{ij}}{c_ic_j}, \qquad (6)$$

where c_{ij} is the second derivative of the cost function. Finally, the AES an be computed from the production function by

$$\sigma_{ij} = \frac{Y}{L_iL_j}\,\frac{F_{ij}}{F}, \qquad (7)$$

where $|F|$ is the determinant of the matrix

$$F = \begin{bmatrix} 0 & f_1 & f_2 & f_r \\ f_1 & f_{11} & f_{12} & f_{1r} \\ f_2 & f_{12} & f_{22} & f_{2r} \\ f_r & f_{r1} & f_{r2} & f_{rr} \end{bmatrix}$$

nd F_{ij} is the cofactor in F associated with factors i and j.

Factors i and j are substitutes (in the Allen-Uzawa sense) if $\sigma_{ij} > 0$, omplements if $\sigma_{ij} \leq 0$. It must be true that at least two of σ_{12}, σ_{1r}, and $_{2r}$ are positive. They are substitutes in the Edgeworth-Pareto sense (or -substitutes) if $f_{ij} < 0$ - that is, if increased supplies of factor i raise he marginal product of factor j.

First of all, consider a small, open economy in which all factors are

in perfectly elastic supply. Clearly a tax on labour type 1 (say) will drive the country out of business. Perfectly elastic supplies imply $\hat{w}_2 = \hat{r} = 0$. Thus $\hat{w}_1 = 0$ from equation (7). But if group 1's pre-tax wage is unchanged by the imposition of the tax, its post-tax wage will fall, a result that is inconsistent with a perfectly elastic labour supply at a constant net-of-tax wage.

More generally, suppose that capital is in perfectly elastic supply at the world price r. Then any policy that leaves untaxed this net-of-tax return must alter the two groups' pre-tax wage rates in opposite directions. This result holds regardless of mobility of labour. It will not hold if capital is not in perfectly elastic supply, or if the government alters the tax on capital.

PROPOSITION: Any change in tax policy towards wage income must yield relative wage changes $\hat{w}_1/\hat{w}_2 = -\alpha_2/\alpha_1$ if capital is in perfectly elastic supply.

Suppose now that S_i is the supply of labour of type i, which is assumed to be a function of the appropriate net wage. Let ε_i be the elasticity of the supply of type i. From Shepherd's Lemma, $c_1(w_1, w_2, r)/c_2(w_1, w_2, r) = S_1/S_2$. If a tax (say on labour of type 1) is imposed, differentiating this relation yields

$$-\{\alpha_k\sigma_{1r} + (\alpha_1 + \alpha_2)\sigma_{12} + \frac{w_1}{w_1-t_1}\varepsilon_1\}\hat{w}_1$$
$$+\{\alpha_k\sigma_{2r} + (\alpha_1 + \alpha_2)\sigma_{12} + \frac{w_2}{w_2-t_2}\varepsilon_2\}\hat{w}_2 = \frac{-\varepsilon_1}{w_1-t_1}\,dt_1 \qquad (8)$$

(where I have used the identity $\sigma_{11} = -(\alpha_2/\alpha_1)\sigma_{12} - (\alpha_k/\alpha_1)\sigma_{1r}$). Substituting for $\hat{w}_2$ from equation (4) (recall $\hat{r} = 0$ because of capital mobility),

$$-\hat{w}_1\{\sigma_{1r}\alpha_k + \sigma_{2r}\alpha_k \frac{\alpha_1}{\alpha_2} + \sigma_{12}\left[\frac{(\alpha_1+\alpha_2)^2}{\alpha_2}\right] + \frac{\varepsilon_1 w_1}{w_1-t_1} + \frac{\alpha_1}{\alpha_2}\frac{\varepsilon_2 w_2}{w_2-t_2}\} = -\frac{\varepsilon_1}{w_1-t_1}\,dt_1 \quad (9)$$

Thus a sufficient condition for $\hat{w}_1 > 0$ when $dt_1 > 0$ is $\sigma_{12} > 0$ and $\alpha_2\sigma_{1r} + \alpha_1\sigma_{2r} > 0$. Moreover,

$$[d(w_1 - t_1)]\frac{\varepsilon_1}{w_1-t_1} =$$

$$-\hat{w}_1\{\sigma_{1r}\alpha_k + \sigma_{2r}\alpha_k \frac{\alpha_1}{\alpha_2} + \sigma_{12}\left[\frac{(\alpha_1+\alpha_2)^2}{\alpha_2}\right] + \frac{\alpha_1}{\alpha_2}\frac{\varepsilon_2 w_2}{w_2-t_2}\}. \quad (10)$$

Hence

PROPOSITION: If $\alpha_k(\sigma_{1r}\alpha_2 + \sigma_{2r}\alpha_1) + \sigma_{12}(\alpha_1 + \alpha_2)^2 > 0$, then an increase in the tax on one type of labour will lower the net wage of both types.

Berndt and Christensen's estimates of substitution relations in American manufacturing yield $\sigma_{12} = 8$, $\sigma_{1r} = 4$, and $\sigma_{2r} = -4$, which support the above condition for plausible factor-share estimates.

A similar analysis can be used to ascertain the effects of a tax policy that lowers the cost of capital, again under the assumption that the capital is in perfectly elastic supply at a given net rate of return. As one might expect, such a policy would benefit most the factor most complementary to capital, in this case skilled labour if one uses the Berndt-Christensen estimates. Now

$$-\hat{w}_1\{\sigma_{1r}\alpha_k + \sigma_{2r}\alpha_k \frac{\alpha_1}{\alpha_2} + \sigma_{12}\left[\frac{(\alpha_1+\alpha_2)^2}{\alpha_2}\right] + \frac{\varepsilon_1 w_1}{w_1-t_1} + \frac{\varepsilon_2 w_2}{w_2-t_2}\frac{\alpha_1}{\alpha_2}\}$$

$$= \hat{r}\{\alpha_k(\sigma_{2r} - \sigma_{1r}) + \frac{\alpha_k}{\alpha_2}[\alpha_k\sigma_{2r} + (\alpha_1 + \alpha_2)\sigma_{12} + \varepsilon_2\frac{w_2}{w_2-t_2}]\}. \quad (11)$$

If σ_{2r} is negative, the wage of unskilled labour may fall in response to a policy to lower the cost of capital, especially if skilled labour is relatively immobile. If $\sigma_{2r} < 0$, the return to skilled labour must rise. 'Reasonable' parameters ($\alpha_1 = .5$, $\alpha_2 = .25$, $\alpha_k = .25$, $\sigma_{12} = 8$, $\sigma_{1r} = 4$, and $\sigma_{2r} = -4$) indicate that the return to both factors would be increased by a policy to lower the cost of capital.

Next, extend the above model to construct one in which the price of Ontario's output is not fixed. Consider a model in which Canada produces two outputs from the three factors used in the previous model. Assume now that labour (of both types) is perfectly mobile within Canada, but immobile internationally. Let Ontario and the rest of Canada each specialize in one output. And assume that capital is in perfectly elastic supply to Canada, at a return that is fixed in terms of the price of the rest of Canada's output. Let this price serve as numéraire, and let p denote the price of Ontario's output. Demand for Ontario's output (and the rest of Canada's) depends only on relative prices. This model is really just the Harberger model with an elastically supplied third factor added and with 'provinces' instead of 'sectors'. Here I wish to show that under quite innocuous restrictions, the basic conclusion of that model holds - namely that if Ontario's output is relatively unskilled-labour-intensive, then a tax on unskilled labour must (a) lower the net wage of unskilled labour, (b) raise the net wage of skilled labour, and (c) raise the price of Ontario's output. These wages and prices are all in terms of the numéraire, the output produced in the rest of Canada.

A set of sufficient conditions for these results is $\sigma_{12} > 0$, $(1-\alpha_k)\sigma_{12}+\alpha_k\sigma_{1r} > 0$, and $(1-\alpha_k)\sigma_{12}+\alpha_k\sigma_{2r} > 0$. Under these conditions, a rise in w_1 must lower c_1/c_2 and a rise in w_2 must raise c_1/c_2, when r is held constant. To prove the results, assume that $c_1^x/c_2^x > c_1^y/c_2^y$, where the superscripts x and y refer to Ontario and the rest of Canada re-

spectively. Thus Ontario's output is assumed relatively unskilled-labour-intensive in physical terms. Now let Ontario raise t_1. Since the rest of Canada's cost function obeys $c^y(w_1, w_2, r) = 1$, equation (4) holds, so that w_1 and w_2 must move in opposite directions. Suppose then that, contrary to the above assertion, the tax change lowers the skilled workers' wage. Then w_1 must rise in the rest of Canada. In that case, under perfect mobility, w_1-t_1 must have risen in Ontario, so that, a fortiori, the gross wage w_1^x has risen in Ontario. Since w_1^x and w_1^y have increased and w_2 has decreased, Ontario and the rest of Canada raise the ratio of skilled to unskilled labour in production, from my assumption that c_1/c_2 falls (in each sector) after such a wage change. Since Ontario is assumed to be more unskilled-labour-intensive, the only way for both sectors to lower the ratio of unskilled to skilled labour and still maintain full employment nationally is for Ontario's output to expand. This expansion can only occur if the price of Ontario's output p has fallen. Now $dp = c_1^x dw_1^x + c_2^x dw_2^x$. Since $dw_2^x = dw_2^y$, $dw_1^x = dw_1^y + dt_1^x$, and $c_1^y dw_1^y + c_2^y dw_2^y = 0$, then $dp = dw_1^y[c_1^x - (c_2^y/c_1^y)c_2^x] + c_1^x dt_1$. If $c_1^x/c_2^x > c_1^y/c_2^y$, then $dp > 0$ if $dw_1^y > 0$. Consequently p cannot fall. Thus the original assumption ($dw_1^y > 0$) was false. Hence the increase in t_1 must raise w_2^y and lower w_1^y. Given the requirement of full employment for all factors, it is then straightforward to show that the price of Ontario's output must rise. Clearly, the above argument can be reversed to show that an increased tax on skilled labour must lower the return on skilled labour, raise it on unskilled labour, and raise the relative price of Ontario's output if Ontario is more skilled-labour-intensive.

The main message of the above analysis is that the effect on net wages of a tax on one type of labour when capital is perfectly mobile is similar to the effect that one would derive from a simpler two-sector model

that ignored capital. This similarity arises in the three-sector model if one assumes that the two types of labour are strong substitutes ($\sigma_{12} >> 0$) and that this substitutability dominates any capital-labour substitutability ($\sigma_{12} > |\sigma_{1r}|$, $\sigma_{12} > |\sigma_{2r}|$). More generally, when capital is perfectly mobile, the key parameters for tax incidence are the factor shares (the α_i's), the substitution parameters (the σ_{ij}'s), and the supply elasticities of the types of labour (the ε_i's). It should also be noted that if data were available, this sort of analysis could be extended to more than three factors, along the lines of Diewert (1971).

In the analysis of the effects of migration in a world in which factors are assumed to be immobile (as in Epstein 1974 and the Bhagwati 1975 brain-drain tradition), the production function itself seems to be more important than the substitution elasticities. Of course, they are related through equation (7). For instance, suppose that all factors are completely immobile. What would be the effect of immigration of type 1 labour? Since $w_i = pf_i(L_1,L_2,k)$ under perfect competition, if the price level p is unchanged then

$$dw_i = pf_{i1}dL_1 \ (i = 1,2), \ dr = pf_{1k}dL_1, \tag{12}$$

so that an influx of type 1 labour will reduce the wage to type 1 labour as long as diminishing marginal returns prevail ($f_{11} < 0$) and will raise the wage of type 2 labour if and only if the two types are q-complements ($f_{12} > 0$).

If capital is perfectly mobile but the two types of labour are not, differentiation of the equation for capital's constant rate of return, $r = pf_k(L_1, L_2, k)$, yields

$$dk = -\frac{f_{1k}}{f_{kk}} dL_1 \tag{13}$$

as the response to immigration of type 1 labour. Since $dw_i = pf_{1i}dL_1 + pf_{ik}dk$,

$$dw_i = p(f_{1i} - \frac{f_{ik}f_{1k}}{f_{kk}})dL_1 \quad (i = 1,2) \tag{14}$$

from the concavity of the production function $f_{11}f_{kk} > (f_{1k})^2$, so that immigration of type 1 labour lowers w_1 when capital is mobile. It will lower the wage of type 2 labour if and only if $f_{12} - f_{1k}f_{2k}/f_{kk} < 0$. If all factors are q-complements, this expression must be positive. Berndt and Christensen's estimates imply f_{12}, $f_{1k} < 0$, $f_{2k} > 0$, so that $\delta w_2/\delta L_2 < 0$. However, these estimates seem to violate the concavity requirement. Using their data on substitution elasticities ($\sigma_{12} = 8$, $\sigma_{1r} = 4$, $\sigma_{2r} = -4$), I calculate that $\delta w_2/\delta L_2 > 0$, but that this result is not very robust with respect to small changes in the σ_{ij}'s or the factor shares. Better knowledge of aggregate substitution relationships may be necessary to yield believable projections of the effect of immigration by one group on another group's wage when capital is mobile.

APPENDIX 2: TAX INCIDENCE IN A HARRIS-TODARO-TYPE MODEL

The Harris-Todaro (1970) model involves equilibrium unemployment because of minimum wages. Here I will examine some tax incidence in a simple generalization of the model to a two-region nation, along the lines of Boadway and Flatters (1981). The two regions are Ontario (denoted x) and the rest of Canada (denoted y). It is assumed that the two types of labour are perfectly mobile between regions, and that capital is internationally mobile at a fixed rate of return r. For class 2, skilled labour, the minimum wage is irrelevant, and so full employment is assumed to prevail. Mobility thus implies

$$w_2^x - t_2^x = w_2^y - t_2^y, \tag{1}$$

where t_i^j is the tax on class i in region j. For class 1, unskilled labour, the minimum wage w_1^{-y} in the rest of Canada is assumed set above the full-employment level. Let e^y denote the probability of finding a job in the rest of Canada. This is by assumption equal to the employment rate among unskilled labour. Then mobility of unskilled labour implies

$$w_1^x - t_1^x = e^y(w_1^y - t_1^y) + (1 - e^y)b^y, \tag{2}$$

where b^y are (net-of-tax) unemployment benefits available in the rest of Canada, as long as full employment prevails in Ontario. If the minimum wage in Ontario were high enough, the probability of employment e^x of unskilled labour in Ontario would be less than one, and the mobility equation for unskilled labour would become

$$e^x(w_1^x - t_1^x) + (1 - e^x)b^x = e^y(w_1^y - t_1^y) + (1 - e^y)b^y. \tag{2'}$$

Let the rest of Canada's output be the numéraire, and let p be the price of Ontario's output. Then zero profit implies

$$c^x(w_1^x, w_2^x, r) = p \tag{3}$$

and

$$c^y(w_1^y, w_2^y, r) = 1, \tag{4}$$

where c^x, c^y are unit cost functions. If x and y are the outputs of the two regions, then $c_i^x x$ is employment of factor i in Ontario. If $\bar{L}_i$ is the total (fixed) population of Canada of class i, then

$$\frac{c_1^x x}{e^x} + \frac{c_1^y y}{e^y} = \bar{L}_1$$

and

$$c_2^x x + c_2^y y = \bar{L}_2.$$

To close the model, one of two assumptions can be made. First, it can be assumed that Ontario's output price is fixed in terms of the numéraire, so

$$p = 1. \tag{7}$$

Then equations (1) through (7) can be solved for the endogenous variables w_1^x, w_2^x, w_2^y, p, e^y, x, and y. Or if there is unemployment in Ontario, replace (2) by (2'), and e^x is a new endogenous variable replacing w_1^x. Alternatively, assume that demand for Ontario's output can be written

$$\left(\frac{x}{y}\right) = \phi(p) \qquad (\phi' < 0). \tag{7'}$$

To simplify somewhat, note that when w_1^y is fixed, w_2^y is uniquely determined in terms of the numéraire by equation (4). This w_2^y (for a given tax policy) uniquely determines w_2^x from equation (1). In turn, w_1^x will be uniquely determined from equation (3) if the price p of Ontario's output is fixed. Note then that all the endogenous wage rates can be determined from equations (1), (3), (4), and (7) without reference to the taxes on unskilled labour. An increase in t_1^x will not therefore affect any wage rates. From equation (3), then, it must lower e^y (if net benefits are higher when workers are employed). From equations (5) and (6), x will decrease and y increase if and only if $e^y c_1^x c_2^y < c_2^x c_1^y$. Thus in the basic model a tax increase on unskilled labour will decrease output in Ontario, raise it elsewhere, and lower unskilled workers' income if Ontario's output is more skilled-labour intensive. An increase in the tax on skilled labour in Ontario must raise w_2^x so as to maintain constant $w_2^x - t_2^x$. Thus w_1^x

must fall to keep Ontario's output price constant. Therefore, e^Y must fall as well. Thus when Ontario has full employment, and its output prices are fixed, unskilled labour (everywhere) bears the burden of any tax increase by Ontario.

If Ontario's output price is variable, so that equation (7') replaces equation (7), and full employment still prevails in Ontario, the equilibrium conditions can be written

$$c^X[w_1^X,\ w_2^Y + t_2^X - t_2^Y,\ r] = p, \tag{8}$$

$$w_1^X - t_1^X = e_1^Y[\bar{w}_1 - t_1^Y] + (1 - e_1^Y)b^Y, \tag{2}$$

$$e^Y c_1^X\ \phi(p)y + c_1^Y y = e^Y \bar{L}_1, \tag{9}$$

and

$$c_2^X\ \phi(p)y + c_2^Y y = \bar{L}_2, \tag{10}$$

where w_2^Y is determined by cost conditions in the rest of Canada (equation 4). Suppose that the following condition holds:

$$\frac{\bar{L}_2}{\bar{L}_1} > \frac{c_2^X}{c_1^X}\ . \tag{11}$$

This condition implies (but is not implied by) a more unskilled-labour-intensive output for Ontario than for the rest of Canada. Then differentiation of equations (2), (8), (9), and (10) implies $\delta w_1/\delta t_1^X > 0$, $\delta p/\delta t_1^X > 0$, and $\delta e^Y/\delta t_1^X < 0$, so that a tax on unskilled labour in Ontario lowers the welfare of unskilled workers everywhere. These results will hold under far weaker conditions than equation (11). The wage of skilled labour will be unchanged, and output outside of Ontario should increase.

The effect of an increase in taxes on skilled labour in Ontario depends on the relative skilled-labour intensity of Ontario's output.

PROPOSITION: A tax on skilled labour (when equations 1 through 6 and 7' hold) in Ontario will make unskilled labour worse off if and only if $(\bar{L}_2/\bar{L}_1 - c_2^X/c_1^X) > 0$.

Note that Ontario's being skilled-labour-intensive $(c_1^X/c_2^X < c_1^Y/c_2^Y)$ is sufficient for equation (11) not to hold, and thus for $\delta w_1^X/\delta t_2^X > 0$. The tax on skilled labour income should certainly raise p and lower x.

Now consider the case of unemployment in both regions, so that equation (2') replaces equation (2). Note that with w_1^Y and w_1^X fixed, if Ontario's output price p is fixed, then so are w_2^X and w_2^Y. Thus if equation (7) holds, a tax on skilled labour is impossible. Only one tax differential, $t_2^X - t_2^Y$, is consistent with equality of price and cost in both regions. Raising t_2^X would cause Ontario's costs to exceed everyone else's (if previously they were equal). A change in the tax on unskilled labour leaves all wages unchanged. The effects on unemployment rates are unclear; the system of equations is undetermined.

If Ontario's price p can vary, and w_1^X is fixed, the equilibrium conditions can be written

$$c^X[w_1^X,\ w_2^Y + t_2^X,\ t_2^Y,\ r] = p, \tag{8}$$

$$e^X[w_1^X - t_1^X] + (1 - e^X)b^X = e^Y[w_1^Y - t_1^Y] + (1 - e^Y)b^Y, \tag{2'}$$

$$e^Y c_1^X\, \phi(p)y + e^X c_1^Y y = e^X e^Y\, \bar{L}_1, \tag{12}$$

and

$$c_2^X\, \phi(p)y + c_2^Y y = \bar{L}_2 \tag{10}$$

- a system of four equations in the four endogenous variables e^X, e^Y, p, and y. Increases in t_1 leave p and y unchanged, raise employment in Ontario, lower it elsewhere, and make unskilled workers worse off. An

increase in t_2 raises p and leaves skilled labour's welfare unchanged. The effect on unskilled labour is ambiguous, although equation (2') shows that e^X and e^Y must move in the same direction when t_2 changes.

PROPOSITION: When there is unemployment in both regions and Ontario's output price varies (equations 1, 2', 3, 4, 5, 6, and 7' hold), then $\delta e^X/\delta t_2^X > 0$ if and only if $c_1^X \bar{L}_2 < e^X c_2^X \bar{L}_1$.

Thus if employment rates were identical, Ontario's being more skilled-labour-intensive would be necessary and sufficient for an increase in the tax on skilled labour in Ontario to make unskilled labour everywhere better off.

APPENDIX 3: SOME SIMPLE RESULTS WITH A NON-TRADED GOOD

Suppose that individuals are perfectly mobile, as is capital, and that there is one good, which must be consumed locally. Let its price be p. Assume that it is produced under constant returns to scale. Then zero profit implies

$$p = c(w_1, w_2, r), \tag{1}$$

where c is the unit cost function. If u_i is the indirect utility function of class i, and Ontario is too small to affect utility elsewhere, then mobility of people implies

$$u_1(w_1 - t_1, p) = \bar{u}_1 \tag{2}$$

and

$$u_2(w_2 - t_2, p) = \bar{u}_2, \tag{3}$$

where $\bar{u}_i$ is the utility attainable elsewhere.

Although equations (1), (2), and (3) serve to determine wage rates w_1 and w_2 and the price p as functions of tax rates, they cannot be regarded as a complete general equilibrium system. 'Adding-up' requires that expenditures by consumers equal factor payments. Where the capital income goes has not been specified here. Moreover, if there is some other sector, its price will be altered by wage changes. This could not hold if the region were a price-taker for traded goods. But the model does offer some simple insights. If we differentiate equations (1) through (3) and use Roy's identity,

$$\delta u_i/\delta p = -x_i(\delta u_i/\delta w_i), \tag{4}$$

where x_i is per capita consumption of the local good by class i, these results are obtained:

$$\begin{aligned}
\frac{\delta p}{\delta t_1} &= \frac{c_1}{1 - c_2x_2 - c_1x_1} \\
\frac{\delta w_1}{\delta t_1} &= \frac{1 - c_2x_2}{1 - c_2x_2 - c_1x_1} \\
\frac{\delta w_2}{\delta t_1} &= \frac{c_1x_2}{1 - c_2x_2 - c_1x_1}
\end{aligned} \tag{5}$$

All of these expressions will be positive if $1 > c_1x_1 + c_2x_2$. But if L_i is the total population of type i, total demand for the local good is $L_1x_1+L_2x_2$. Thus total demand for factor i in the local-good industry is $c_i(L_1x_1 + L_2x_2)$. Since this cannot exceed L_i, $1 \geq c_1x_1 + c_1x_2\ (L_2/L_1)$ and $1 \geq c_2x_2 + c_2x_1\ (L_1/L_2)$. Together these imply $1 - c_1x_1 - c_2x_2 > 0$. The effects on increases in t_2 will be similar; p, w_1, and w_2 will all rise.

In the second model, local output is produced entirely by professionals. 'Other' labour combines with capital to produce a traded good. Thus $p = w_2$. Hence equation (3) implies, when professionals are perfectly

mobile,

$$\frac{\delta p}{\delta t_2} = \frac{1}{1-x_2} \quad . \tag{6}$$

Since $L_2 \geq L_1 x_1 + L_2 x_2$, the denominator in (6) is positive. Now if labour of type 1 is perfectly mobile, equation (2) implies

$$dw_1 = dt_1 + x_1 dp. \tag{7}$$

Thus an increase in t_2 must raise w_1, since it raises p. A decrease in t_1 lowers w_1. Thus a rise in t_2 and fall in t_1 will raise w_2 and p, will raise $w_2 - t_2$ and $w_1 - t_1$, and may lower w_1 if x_1 is small (and $|dt_1|$ is large relative to $|dt_2|$). Since the cost of the exported good is $c(w_1, r)$, a fall in w_1 would lower its price, inducing an increase in output and an immigration of non-professionals.

NOTES

1 See Flatters, Henderson, and Mieszkowski (1974) or Atkinson and Stiglitz (1980, ch. 7).

2 See Caves and Jones (1973) or any textbook on the theory of international trade.

3 That is, the cost of producing one unit of output when labour's price is w and the required rate of return on capital is r. See Appendix 1.

4 See Appendix 1 for the formal derivation of these results.

5 See Appendix 2 for a simple model of this sort.

6 Harberger (1962) is the original work here. Mieszkowski (1969), McLure (1975), and Atkinson and Stiglitz (1980, ch. 6) provide expositions.

7 See Atkinson and Stiglitz (1980, ch. 6) for the derivation and exposition of these results.

8 See Vandendorpe and Friedlander (1976) for the results when existing taxes are changed.

9 See Appendix 1 for the formal derivation of these results.

10 If u(y,p) represents a group's indirect utility function, depending on income and the price of some good, then holding utility constant implies $(\delta u/\delta y)dy + (\delta u/\delta p)dp = 0$. From Roy's identity (see Varian 1978, ch. 3), $dp = x\,dy$ where x is consumption of the good whose price is p.

11 See Appendix 3 for a formal derivation of these results.

12 See, for instance, Oates (1969), Edel and Sclar (1974), Wales and Wiens (1974), Meadows (1976), and Epple (1980).

13 Ignoring repayment of principal, the annual cost of housing is (t+r)v. For this to be constant, v dt + (t+r)dv = 0.

14 Let u(y,p) be the indirect utility function, depending on income, and the annual housing cost p = (t+r)v. As in note 15, for constant utility dp = h dy, so that dv/v = dp/(t+r)v = dp/p = h/p dy = (dy/y)(h/py).

15 Assuming that all classes were bidding the same amount for the house before the tax change.

16 See Bucovetsky (1982) for an analysis of metropolitan location and property tax capitalization that obtains such a result.

17 Bhagwati and Hamada (1982) assume that only the preferences of those residents who stay matter.

18 See also Wildasin (1983).

19 See, for instance, Scarf and Shoven (1982) and Ballard, Fullerton, Shoven, and Whalley (forthcoming).

REFERENCES

Atkinson, A., and J. Stiglitz (1980) Lectures on Public Economics (New York: McGraw-Hill)

Ballard, C., D. Fullerton, J. Shoven, and J. Whalley (forthcoming) General Equilibrium Analysis of U.S. Tax Policy. Prepared for the National Bureau of Economic Research (Chicago: University of Chicago Press)

Berndt, E. and L. Christensen (1974) 'Testing for the existence of a consistent aggregate index of labor imputs.' American Economic Review 64, 391-404

Berry, R.A., and R. Soligo (1969) 'Some welfare aspects of international migration.' Journal of Political Economy 77, 778-94

Bhagwati, J., ed. (1975) 'The brain drain: a symposium.' Journal of Development Economics 2, no. 3

Bhagwati, J., and K. Hamada (1982) 'Tax policy in the presence of emigration.' Journal of Public Economics 18, 291-318

Boadway, R., and F. Flatters (1981) 'The efficiency basis for regional employment policy.' Canadian Journal of Economics 14, 58-77

- (n.d.) 'The case for equalization payments.' Mimeographed

Bucovetsky, S. (1981) 'Optimal jurisdictional fragmentation and mobility.' Journal of Public Economics 16, 145-70

- (1982) 'Inequality in the local public sector.' Journal of Political Economy 90, 128-45

- (1983) 'Exit, voice and mobility: towards a positive theory of federalism.' Paper presented at Canadian Economics Association Meetings, June

Canadian Tax Foundation (1982) The National Finances 1981-82 (Toronto)
Catsambas, T. (1978) Regional Impacts of Federal Fiscal Policy (Lexington: D.C. Heath)
Caves, R., and R. Jones (1973) World Trade and the Balance of Payments (Boston: Little, Brown)
Cebula, R. (1974a) 'Interstate migration and the Tiebout hypothesis: an analysis according to race, sex and age.' Journal of the American Statistical Association 69, 876-9
- (1974b) 'Local government policies and migration: an analysis for SMSA's in the United States 1965-70.' Public Choice 19, 85-94
- (1979a) 'A survey of the literature on the migration-impact of state and local government policies.' Public Finance/Finance Publiques 24, 69-84
- (1979b) The Determinants of Human Migration (Lexington: D.C. Heath)
- (1980) 'Voting with one's feet: a survey of the evidence.' Regional Science and Urban Economics 10, 91-107
Courchene, T. (1970) 'Interprovincial migration and economic adjustment.' Canadian Journal of Economics 3, 550-76
- (1974) Migration, Income and Employment in Canada 1965-68 (Montreal: C.D. Howe Institute)
Courchene, T., and K. Dowd (1983) 'Towards a theory of equalization payments'. Working Paper (Toronto: Ontario Economic Council)
Diamond, P. (1978) 'Tax incidence in a two good model.' Journal of Public Economics 9, 283-300
Diewert, W.E. (1971) 'A note on the elasticity of derived demand in the N-factor case.' Economica 38, 192-8
- (1974) 'Unions in a general equilibrium model.' Canadian Journal of Economics 7, 475-95
Edel, M., and E. Sclar (1974) 'Taxes, spending and property values: supply adjustment in a Tiebout-Oates model.' Journal of Political Economy 82, 941-54
Ellickson, B. (1971) 'Jurisdictional fragmentation and residential choice.' American Economic Review May 61, 334-9
Epple, D. (1980) 'What do tests of tax capitalization test?' Working Paper, GSIA, Carnegie-Mellon University
Epstein, L. (1974) 'Some economic effects of immigration: a general equilibrium analysis.' Canadian Journal of Economics 7, 174-90
Flatters, F., J.V. Henderson, and P. Mieszkowski (1974) 'Public goods,

efficiency and regional fiscal equalization.' Journal of Public Economics 3, 99-112

Foot, D., and W. Milne (1981) 'Public policies and interprovincial migration in Canada: an econometric analysis.' Working Paper No. 8126, Institute for Policy Analysis, University of Toronto

Goldstein, G., and M. Pauly (1981) 'Tiebout bias on the demand for local public goods.' Journal of Public Economics 16, 131-44

Greenwood, M. (1975) 'Research on internal migration in the United States: a survey.' Journal of Economic Literature 8, 397-433

Grieson, R. (1980) 'Theoretical analysis and empirical measurement of the effects of the Philadelphia income tax.' Journal of Urban Economics 8, 123-37

Greison, R., W. Hamovitch, A.M. Levenson, and R.D. Morgenstern (1977) 'The effect of business taxation on the location of industry.' Journal of Urban Economics 4, 170-85

Hamada, K., and J. Bhagwati (1975) 'Domestic distortions, imperfect information, and the brain drain.' Journal of Development Economics 2, 265-80

Harberger, A. (1962) 'The incidence of the corporation income tax.' Journal of Political Economy 70, 215-40

Harris, J.R., and M. Todaro (1970) 'Migration, unemployment and development: a two-sector analysis.' American Economic Review 62, 126-41

Haurin, D. (1980) 'The regional distribution of population, migration, and climate.' Quarterly Journal of Economics 293-308

- (1981) 'Local income taxation in an urban area.' Journal of Urban Economics 10, 323-37

Henderson, J.V. (1977) Economic Theory and the Cities (New York: Academic Press)

Hirschman, A. (1970) Exit, Voice and Loyalty (Cambridge: Harvard University Press)

Homma, M. (1977) 'On the theory of interregional tax incidence.' Regional Science and Urban Economics 7, 377-92

Homma, M., and M. Yamada (1980) 'A dynamic model of individuals between jurisdictions in a system of local government.' Regional Science and Urban Economics 10, 109-22

Jones, R. (1967) 'International capital movements and the theory of tariffs and trade.' Quarterly Journal of Economics 81, 1-38

- (1979) International Trade: Essays in Theory (Amsterdam: North-Holland)

Kumar, R. (1977) 'More on non-white migration, welfare levels and the political process.' Public Choice 32, 151-4

Liu, B.C. (1977) 'Local government finance and metropolitan employment growth: a simultaneous-equations model.' Southern Economic Journal 43, 1379-85

McCulloch, R., and J. Yellen (1977) 'Factor mobility, regional development, and the distribution of income.' Journal of Political Economy 85, 79-96

McGuire, M. (1974) 'Group segregation and optimal jurisdictions.' Journal of Political Economy 82, 112-32

- (1982) 'Factor taxes, factor migration and welfare.' Canadian Journal of Economics 15, 247-62

McLure, C. (1964) 'Commodity tax incidence in open economies.' National Tax Journal 17, 187-204

- (1967) 'Tax exporting in the United States: estimates for 1962' National Tax Journal 20, 49-77

- (1969) 'Interregional incidence of general regional taxes.' Public Finance/Finances Publiques 24, 457-84

- (1975) 'General equilibrium incidence analysis: the Harberger model after ten years.' Journal of Public Economics 4, 125-62

McMillan, M., and K. Norrie (1980) 'Province-building vs. a renter society.' Canadian Public Policy Supplement 6, 213-20

Meadows, G. (1976) 'Taxes, spending and property values: a comment and further results.' Journal of Political Economy 84, 869-80

Mieszkowski, P. (1969) 'Tax incidence theory: the effects of taxes on the distribution of income.' Journal of Economic Literature 1103-24

Migué, L. (1979) Nationalistic Policies in Canada: an Economic Approach (Montreal: C.D. Howe Institute)

Mishan, E., and L. Needleman (1968) 'Immigration: some long-term economic results, Part A.' Economica Internazionale 21, 281-300

Oates, W. (1969) 'The effects of property taxes and local public spending on property values: an empirical study of tax capitalization and the Tiebout model.' Journal of Political Economy 77, 951-71

- (1972) Fiscal Federalism (New York: Harcourt Brace Jovanovich)

Pack, J. (1973) 'Determinants of migration to central cities.' Journal of Regional Science 13, 249-60

Pauly, M. (1973) 'Income distribution as a local public good.' Journal of Public Economics 2, 35-58

Phares, D. (1980) Who Pays State and Local Taxes? (Cambridge, Mass: Oelgeschlager, Gunn and Hain)

Robinson, C., and N. Tomes (1982) 'Self-selection and interprovincial migration in Canada.' Canadian Journal of Economics 15, 474-502

Scarf, H., and J. Shoven, eds. (1982) Applied General Equilibrium (Chicago: University of Chicago Press)

Schwartz, A. (1976) 'Migration, age and education.' Journal of Political Economy 84, 701-20

Stigler, G. (1957) 'The tenable range of functions of local government.' In Joint Economic Committee, Sub-Committee on Fiscal Policy, Federal Expenditure Policy for Economic Growth and Stability (Ottawa)

Usher, D. (1980) 'How should the redistributive power of the state be divided between federal and provincial governments?' Canadian Public Policy 6, 3-15

Vandendorpe, A., and A. Friedlander (1976) 'Differential incidence in the presence of initial distorting taxes.' Journal of Public Economics 6, 205-30

Vanderkamp, J. (1968) 'Interregional mobility in Canada: a study of the time pattern of migration.' Canadian Journal of Economics 1, 595-608

- (1971) 'Migration flows, their determinants and the effects of return migration.' Journal of Political Economy 79, 1012-31

Varian, H. (1978) Microeconomic Analysis (New York: W.W. Norton)

Wales, T., and E. Wiens (1974) 'Capitalization of residential property taxes: an empirical study.' Review of Economics and Statistics 56, 329-33

Wheaton, W. (1977) 'Income and urban residence: an analysis of consumer demand for location.' American Economic Review 67, 620-31

Wildasin, D. (1983) 'The welfare effects of government grants in an economy with independent jursidictions.' Journal of Urban Economics, 13, 147-64

Wilson, J. (1980) 'The effects of potential emigration on the optimal linear income tax.' Journal of Public Economics 14, 339-54

- (1982) 'Optimal linear income taxation in the presence of emigration.' Journal of Public Economics 18, 363-80

Winer, S., and D. Gauthier (1981) International Migration and Fiscal Structure: An Econometric Study of the Determinants of Interpro-

vincial Migration in Canada (Ottawa: Economic Council of Canada)

Yohe, G. (1979) Exercises and Applications for Microeconomic Analysis (New York: W.W. Norton)

OEC PIT Reference: Common Market Aspects

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In recent years, the government of Ontario has taken an active interest, especially in connection with the constitutional debate, in measures to preserve and strengthen the Canadian common market.[1] Any federal or provincial fiscal or regulatory measures that discriminate between activities (residency, consumption, employment, production) on the basis of the province in which they occur constitute violations of the common market principle. Following the 1981 federal budget, the Treasurer of Ontario expressed concern that under the current tax collection agreement Ontario is forced to participate in policies that 'may not be in the best interests of the people of Ontario' (Ontario 1982a, 25). He suggested that in order to 'keep personal income tax policy sensitive to the needs of the people of Ontario' (ibid., 26) the province may wish to opt out of the tax collection agreement and establish its own personal income tax (PIT) system. It may appear, at least superficially, that such a move would contradict the province's expressed interest in strengthening the institutions of the Canadian common market. The purpose of this paper is to review some of the questions arising from the apparent conflict between any increase in provincial autonomy with respect to the PIT and the common market principle. The first section examines two questions: How much new discretionary power would the province derive from the adoption of its own PIT system? How would such authority likely be exercised? I then discuss the more general question of the economic case for preserving the Canadian common market. This case rests on well-known arguments concerning the gains from free trade and factor mobility. However, it is necessary to consider the effects of unequal provincial fiscal capacities and of regional unemployment differentials on these familiar arguments. The

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final section reviews the available evidence concerning the extent of existing barriers to the free movement of goods, people, and capital between regions in Canada and attempts to answer this question: Would the existence of provincial differences in personal income tax add significantly to such barriers?

HOW MUCH AUTONOMY WOULD BE GAINED AND HOW MIGHT IT BE USED?

Influence in tax structure design

Under the current tax collection agreement for the personal income tax, the federal government defines taxable income and determines the rate structure for the collection of income tax from all Canadians. In the simplest case, each province (except Quebec, which has opted out of the agreement) asks the federal government to collect from its residents an amount equal to a certain percentage of the federal basic tax collected in the province. These taxes are collected by the federal government free of charge and remitted to the provincial government. In this simple case the only freedom available to a provincial government is the freedom to set the percentage of federal basic tax revenues that will be collected on its behalf. The rate structure, the definition of taxable income, and the definition of residency are all determined by the federal government. If this were the end of the story, a province would indeed gain considerable additional powers by adopting its own PIT. There are two reasons why this might not be so. First, provinces have in fact considerably more freedom to alter their PIT systems than this simple description suggests. Second, provincial governments possess many policy tools that could be used to the same ends as alterations in the personal income tax. These points will be discussed in turn.

The tax collection agreement does not restrict a province to simply receiving a flat percentage of the federal basic tax from each of its residents. The federal government is willing, for a fee, to administer provincial tax credit schemes, which can serve a variety of distributive and other economic purposes. For instance, the government of Ontario has introduced tax credits with respect to Ontario sales tax payments, property taxes, home heating costs, and political contributions. The value of these credits, which can be claimed by any taxpayer, depends (negatively) on the taxpayer's and/or his family's income; consequently, the

effect of the credits is to make the provincial income tax more progressive than the federal tax. Other provinces have introduced similar credits. The only provincial tax credits that the federal government will apparently not administer are those that discriminate on the basis of the province in which the income is earned. For example, the federal government refused to allow a proposed British Columbia tax credit in respect of dividends received from companies in that province. In other words, it is only tax credits that explicitly violate the common market principle that seem to be ruled out under the tax collection agreement. Aside from this restriction, the provinces have considerable power to alter both the definition of the income base and the degree of progressivity of the income tax structure. Indeed, although such a scheme has not been attempted anywhere, it is questionable whether the federal government would refuse to collect a provincial PIT even if the percentage of federal basic tax collected depended on the individual taxpayer's income level. In practice, then, the provinces might well be able to have rate structures different from that of the federal government.

In summary, the current tax collection agreement allows the provinces considerable freedom with respect to the overall progressivity of tax collections and the definition of the income tax base. The primary restriction is the disallowance of measures that would discriminate on the basis of the province in which income is earned. The third element in the design of a provincial PIT, the definition of residency, offers no flexibility. It would be impossible under the agreement for a province to follow Quebec's lead in declaring some persons to be residents of Quebec for tax purposes even though they resided in a different province on December 31 of the taxation year.[2]

Although it is technically true that the provinces have considerable autonomy in the design of their PIT systems, there still seem to be serious concerns about provincial powers under the tax collection agreement. One concern relates to the timing of policy initiatives. Any province that is a party to the agreement must automatically adopt any federal policy changes that affect the basic federal tax paid by residents of the province. For instance, any changes in personal or other exemptions, or in the rate structure, automatically apply to provincial income tax collections. In the absence of adequate prior consultation and procedures for resolving differences in policy goals, a province might unwillingly become party to tax changes that it does not perceive to be in its interests. While the prov-

ince could in many cases use the above-described flexibility in the design of its PIT system to counteract the undesirable aspects of federal changes, it could do so only with some lag. The provinces would tend to find themselves adopting a defensive posture, always responding to federal initiatives. It seems possible that in the long run the provinces, individually or collectively, could design and implement measures that would effectively nullify most federal income tax policies. Since the reverse is also true, the real danger might be the equivalent of a tariff war - a personal income tax war between a province or group of provinces and the federal government. The economic costs of such a war and the likely long-run outcome would be difficult to predict. It is hard to believe, however, that the federal government would continue to implement provincial tax changes under the tax collection agreement that were obviously designed to nullify the effects of federal policies.

The above discussion presumes both the presence of significant differences between the policy goals of the provinces and the federal government and the absence of an adequate consultative mechanism for resolving such differences. Since policy differences are unavoidable in a federal country, especially when the federal and provincial governments share the same tax fields, the importance of having an adequate consultative mechanism is obvious. Ontario dislikes the federal government's apparent presumption that the provinces are willing to adopt whatever new policies the federal government announces. In short, the consultative mechanisms are inadequate and the provinces feel that their policy preferences carry too little weight. With adequate consultation, of course, the provinces would be able to influence not only the provincial share of the income tax, but also the federal share. On the other hand, while a province that opted out of the current arrangement might gain more control over the structure of its share of the income tax, it would presumably have less influence over the federal share than it would have under an improved tax-sharing agreement. In other words, a province might gain greater power over the design of the overall income tax structure by seeking to improve the consultative process under the current agreement than by choosing to 'go it alone'.

Substitutes for power over the tax structure

The personal income tax is only one of many fiscal and regulatory tools

available to provincial governments. There are other, more potent instruments that could be and indeed are used to achieve provincial policy goals. Again, the main restriction on the provinces' use of the income tax is the restriction on their ability to use it in a manner that would violate the common market principle. When the treasurer says that 'Ontario has specific concerns about the treatment of investors and investment income' (Ontario 1982b, 27), it is presumably this restriction that he has in mind. He would like to be able to use the PIT system to 'create investment and jobs in Ontario' (ibid.). Yet given the considerable mobility of capital into and out of the province, the personal income tax would be a clumsy and possibly quite ineffective instrument for this purpose. It could be used to encourage saving, but there is no necessary link between increased saving by Ontario residents and increased investment in Ontario.[3] A more direct way to encourage investment in Ontario would be through subsidies to firms and/or individuals who invest in the province. Catalogues of the types of instruments that are used for this purpose in Canada are available elsewhere (see Davenport et al. 1982). The addition of PIT to this arsenal would add very little to provincial powers in this regard.

It is even more difficult to imagine how the personal income tax would be used as a job creation device. The best tool for this purpose would be some sort of wage or employment subsidy. Such a program would be very difficult to administer through the PIT system. Since there is nothing to prevent the province from creating jobs through more direct measures, it is doubtful that a separate provincial PIT would be of any additional value.

In summary, the simple point of this section is that a separate PIT would be an inadequate instrument for accomplishing goals that cannot be achieved through the income tax under the current tax collection agreement. Furthermore, other instruments which are already available might well be far superior for these purposes.

How would Ontario use its own PIT?

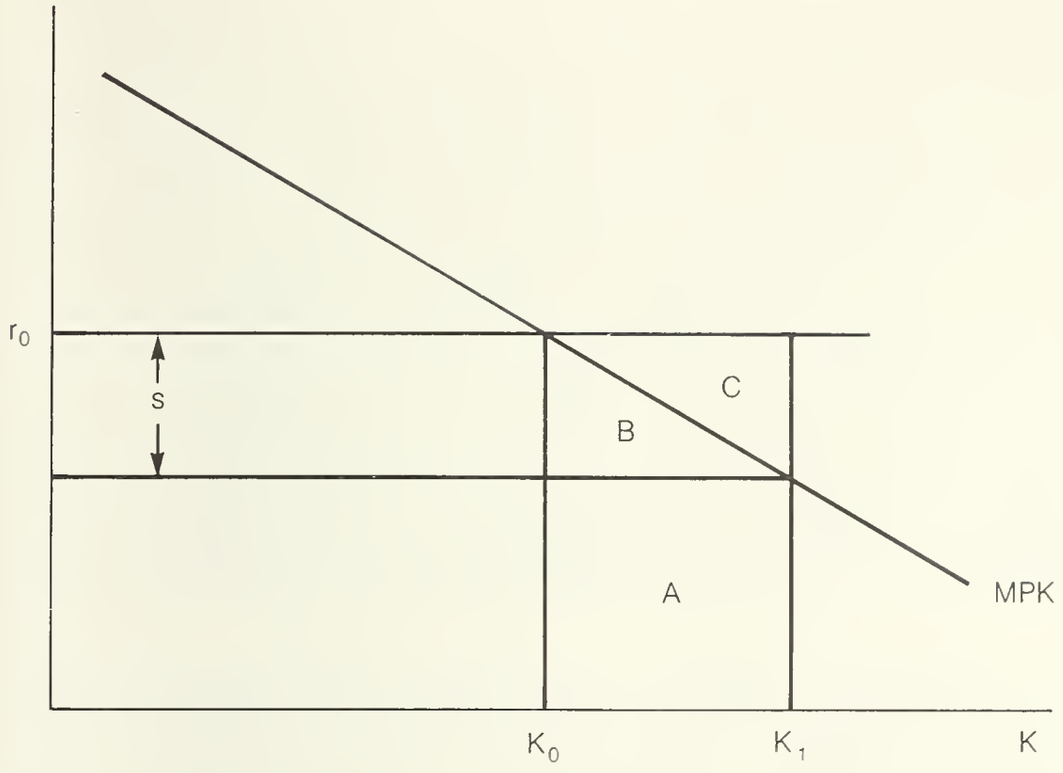
My previous references to statements by the provincial treasurer have already touched on this question. Rather than pursue that line of investigation any further, this section will approach the question by asking what is in the long-run interest of the province. The literature provides two quite different answers. The first answer is based on the findings of

economic theory and the second on observation of the way provinces behave. I shall deal with them in turn.

Economic theory has little to say about whether a province might wish to pursue redistributive policies different from those of the federal government or other provinces. Yet one of the reasons for having a federal structure of government, presumably, is that it makes such differences feasible. But would it be in the interest of a province to use its tax system, or any other policy instrument, to violate the common market principle? With very few exceptions, the Canadian provinces are small in an economic sense. That is, the economy of a province is so small relative to all the markets in which it operates that there is nothing it can do to alter the relative world prices of goods that are traded outside of the province or of interregionally and internationally mobile factors of production. In an economy so small and so open, the true social opportunity cost of any such goods and factors of production is the world market price. Any policy that caused a divergence between the local price and the world price of any of these goods would distort market signals and reduce the welfare of the residents of the province. This is really nothing more than the well-known point that a small country can only hurt itself by imposing a protective tariff.

Is the same thing true of measures designed to influence population size or the level of investment through interregional (or international) factor movements? In the absence of any other distortions in the local economy, it is certainly true that for a small province the optimal subsidy on foreign investment is zero: the province cannot gain by increasing investment through subsidies. This can be seen in Figure 1, where, for simplicity, it is assumed that all capital in the province is foreign-owned. The return on capital in world markets is given by r_0. In the absence of local taxes or subsidies, capital will be invested in the province until the marginal product of capital is equal to r_0; that is, at K_0. A subsidy of s per unit of capital would increase the stock of capital to K_1. The net increase in provincial output would be the sum of the areas A and B, while the increase in dividends paid to foreign capital owners would be A + B + C. The net cost of this subsidy to the province is thus given by the area C. What this does not take into account, however, is the use of local taxes on labour and capital to finance the provision of provincial services. There are certain situations with respect to the taxation of capital in which a small province might gain by inducing a greater capital inflow than would

Figure 1



be achieved by market forces alone. Suppose that the foreign supplier of capital taxes the returns to capital at a rate of, say, 50 per cent, but allows a tax credit of up to that amount for capital taxes paid to governments in the country in which the capital is invested. In such a case, Ontario would be able to impose a tax of up to 50 per cent on returns to foreign capital invested in Ontario, and this tax would have no effect on the amount of capital invested in the province. Such a tax would benefit the residents of the province by, in effect, transferring tax revenues from foreign treasuries to the Ontario treasury. In this situation it could be asked again whether the province might gain by introducing a subsidy to attract further foreign investment. The answer is that it is highly unlikely that a subsidy would have any effect at all on investment, since it would just increase the investors' tax liabilities abroad by an amount equal to the size of the subsidy. Ontario would simply lose an amount equal to the subsidy. However, if for some reason the foreign government did not account for such subsidies in determining the firms' taxable incomes, there would be a net gain to the residents of Ontario for any subsidy up to 50 per cent. Net government revenues from a 50 per cent profits tax and an equal subsidy would be zero, but there would be an increase in the in-

comes of labour and other fixed factors in Ontario greater than the loss in government revenue.

Now consider the cases of taxes on the incomes of local residents or on the income generated by immobile resources in the province. In both cases assume that the revenues are used to provide provincial services for residents of the province. To simplify the discussion and avoid repeating some of the earlier analysis, it will be assumed that labour and some fixed resource are the only two factors of production; labour is assumed to be interregionally mobile and to respond to economic incentives (wages and net benefits from public sector activities) in migration decisions. In this context two related questions might be asked. First, starting from some equilibrium situation, would a province derive a net benefit from some increase (or decrease) in its population? Second, if the answer to this question is affirmative, would it be in the interest of the province to alter its public expenditure (or taxation) decisions to induce changes in its population?

A change in a province's population would affect the welfare of existing residents in several ways: factor incomes would be altered by the effects on factor prices; the size of the tax base and hence the per capita tax cost of provincial services would change; there might be congestion (or economies of scale) in the use of provincial services that would affect the benefits existing residents derive from them. It would be an exceptional situation in which all of these effects cancelled out and left a net social benefit to existing residents from an increase in population of zero. Suppose, for instance, that a province were underpopulated relative to its optimum. Would it be worthwhile for the provincial government to increase spending on public services in order to induce further migration into the province? One view is that it would depend on the type of taxation system used in the province (see Starrett 1980). The conjecture is that a province that relied on the taxation of the income of its residents (a residence-based tax system) would tend to overspend on provincial services, while a province that raised revenue on all income sources in the province (a source-based tax system) would tend to underspend on provincial services. In the case of residence-based taxes, the advantage of overspending is based on the presumption that the induced migration would add less to congestion than to increasing the tax base.

Robin Boadway (1982) has built four simple models that submit these conjectures to a more rigorous examination. In each model he determines

the optimal behaviour rules for a provincial government to follow in choosing the level of government expenditure. The models differ according to whether provincial revenues are from residence- or source-based taxes and whether the provincial government takes into account the migration response to changes in its expenditures. The surprising result of this exercise is Boadway's discovery that when provincial governments are aware of the induced migration effects of public expenditures the optimal decision rule ignores them. The analytical reason for this is that a province that attempts to maximize the well-being of its own residents subject to the constraint that migrants will move to equalize interprovincial differences in utility levels is actually solving the same problem faced by a federal government that attempts to maximize national welfare subject to the migration constraint. Consequently there is no incentive for a provincial government to alter its expenditures in order to increase or decrease population, regardless of whether the province is under- or over-populated or whether it uses residence- or source-based taxes. In fact, the only case in which a province is not induced to behave in the socially optimal way is the case in which it ignores migration responses and relies on source-based taxation of property that is partially owned by non-residents. In this case, the province has an incentive to overspend on public services, since it can shift some of the cost of these services onto non-residents.

A deficiency of Boadway's discussion is that it does not consider the possibility of a province's using the provincial budget to attract capital. However, since our earlier analysis suggested that it would not be in the interest of a small province to distort the price system to attract investment from outside the province, it seems unlikely that the addition of this complication to Boadway's analysis would alter the general results.

What economic theory seems to tell us, then, is that a province has no incentive to use its tax or expenditure system in a way that would abuse the common market principle. In order to justify such use, it would be necessary either to alter some of the assumptions of the model (e.g., to introduce externalities related to investment decisions) or to abandon the hypothesis that provincial governments wish to increase the welfare of all of their citizens (by introducing, for instance, the notion of interest groups that compete to influence government behaviour). Instead of proceeding in either of these directions at this time, let us examine the way in which provincial governments actually appear to behave. What is

abundantly clear to anyone who follows policy discussions in Canada is that the behaviour of governments at all levels is quite different from the behaviour that our simple models predict. The 'bonusing' system, under which entrepreneurs travel from municipality to municipality seeking tax concessions, was well established in the nineteenth century (see Naylor 1975). Today, industrial development commissioners play an important role in municipal efforts to attract investment. At the federal level, the National Policy in one form or another has been a centrepiece of Canadian economic policy since Confederation. Today, this policy is often described as our 'industrial policy' or 'economic development policy', various versions of which are advocated and implemented by different government departments in Ottawa (see Canada 1981 and Abonyi and Flatters 1982).

Provincial government behaviour is no different. One of the peak periods of investment-seeking activity was the 1930s, when the Rowell-Sirois Commission described the fierce fiscal jungle that had arisen from interprovincial competition for investment and jobs. Today, many authors view the 'province-building' activities of provincial governments as one of the greatest threats to Canada's common market. I shall refer to these policies later. My reason for drawing attention to them here is to demonstrate the contrast between the prescriptions of economic theory and the behaviour of governments.

Summary

Provincial governments have more power than might initially be apparent over the design of their PIT systems. They certainly have not exhausted all of the options available to them under the tax collection agreement. Nevertheless, the provinces could gain power by altering the agreement or, in the extreme case, opting out of it. One can envisage changes in procedure and thus give the provinces greater influence in the drafting of changes in the tax structure. By opting out (or by achieving suitable changes in the agreement), a province would be able to use its PIT system in violation of the common market principle. However, since the provinces already have many instruments at their disposal that could be used for regionally discriminatory purposes, and since most of these tools would be at least as effective as the personal income tax, this second source of power would seem to be of little additional value. Finally, there is considerable conflict between the apparent general interest of the residents of a

province in minimizing interference with the common market and the actual behaviour of provincial governments.

THE ECONOMIC CASE FOR THE CANADIAN COMMON MARKET

The political-constitutional framework

Anyone whose knowledge of Canada was limited to the BNA Act or the recently patriated constitution would conclude that there is little interest in this country in preserving a national common market. Compared with other federations, or even weaker organizations such as the EEC, Canada maintains very few legal or constitutional restrictions against abuses of the common market principle. The only part of the BNA Act that pertains to the common market is section 121:

> All articles of the Growth, Produce, or Manufacture of any of the Provinces shall, from after the Union, be admitted free into each of the other Provinces.

What is noteworthy about this provision is what it excludes from consideration. It applies only to interprovincial trade in goods; there is no reference to interprovincial flows of services, labour, and capital. Indeed, it is not even clear that the provision upholds the free passage from province to province of goods of foreign manufacture. It seems to apply only to tariff-type trade barriers, and it is not clear that it restricts federal government powers at all. While other sections of the act give exclusive power to the federal government to regulate interprovincial trade, countervailing provincial powers put serious limits on the federal government's ability to preserve the common market. The same is true of the exclusive federal power over indirect taxation.

The new Constitution Act offers very little improvement. The only new provisions concerning the movement of goods between regions appear in the amended Section 92A: they are intended to prevent provinces from using their regulatory power over non-renewable resources and electricity to discriminate among customers in different provinces. A new section on mobility rights prohibits laws that discriminate on the basis of a person's province of residence. However, the act does permit discriminatory actions that have as their object the helping of individuals in a province 'if the rate of employment in that province is below the rate of employment

in Canada'. Thus, there is in effect a blanket exemption from the anti-discrimination provisions for all provinces with above-average unemployment rates. Finally, there is nothing in the constitution to prevent violations of the common market principle with respect to interprovincial flows of investment.

The absence of constitutional protection for the common market would not be significant if there were effective political forces at work to prevent deviations from the common market principle. Some observers argue that since the federal government must respond to a nation-wide constituency, it has a strong political interest in avoiding discrimination in favour of or against any particular region (see Chrétien 1980). This motive, upheld by the strong federal powers embedded in the constitution, should be sufficient to preserve the common market. Unfortunately, both of the assumptions underlying this proposition are questionable. Provincial governments have substantial power to interfere with the common market, regardless of the wishes of the federal government; moreover, since a federal government can hold power with only a bare majority of the seats in Parliament, it is not necessarily to its disadvantage to implement policies that favour only a subset of Canadian regions. Indeed, it has been a common complaint of Westerners that federal policy favours the manufacturing interests of Ontario and Quebec. These considerations cast substantial doubt on the argument that strong federal government power will protect the common market against local pressures for regionally discriminatory measures.

Are there political forces acting on provincial governments that prevent them from engaging in regionally discriminatory behaviour? Such pressures might derive from either the independent behaviour of provincial governments acting in the collective interest of their citizens or a recognition of the mutual advantages of interprovincial cooperation to restrain the use of discriminatory policies. The first of these possibilities would occur if provincial governments recognized that, because they lack significant monopoly power, they would only lose by engaging in protectionist policies to encourage local production or investment. The reason why this consideration will not necessarily ensure against the use of discriminatory policies is that the costs of protectionist policies are not spread evenly across the local population. Generally the costs of protection are widely dispersed across the population, while a much smaller group of citizens actually benefits from them. The assymetry of the distribution of gains and losses, together with the costs of engaging in political activity, will

tend to create powerful political forces in favour of protection.

Even so, the second possibility referred to above still holds some promise. While it might appear to be in the short-run political interest of a province to offer subsidies to new investments, the apparent gains from such activity would be diminished considerably by parallel behaviour by other provinces. The greater the interprovincial competition for such investments, the larger the subsidy would have to be in order to be successful and the smaller would be the apparent gains. Clearly, it would be in the interest of all provinces to agree to limit or even refrain from such protectionist policies. The problem is that there are always strong forces acting on such agreements that tend to destabilize them. Whenever such an agreement is in effect, it is always in the interest of any single province to find ways to violate it. Since this is true of all provinces, the agreement's long-term prospects are bleak. This is an example of a much more general phenomenon, often observed in cartels, known as the 'prisoners' dilemma'.[4]

It is difficult to be sanguine, therefore, about the existence of political forces that tend to preserve the Canadian common market. Of course, neither the absence of these forces nor the weakness of legal-constitutional protections for the common market would matter very much if there were not a strong case for a Canadian common market or if there were few violations of the common market principle. The remainder of this section is devoted to an examination of the case for the common market, and the succeeding section examines evidence concerning the extent of discriminatory government policies in Canada. While some of the important arguments in favour of the common market might be other than economic, it is on the economic arguments that the discussion will focus.

The simple argument[5]

In a common market, competitive forces ensure that users of goods obtain them from the lowest-cost sources of production and that all production occurs according to the best methods available and in the least-cost locations. Restrictions on the interregional flows of goods induce consumers to substitute in favour of inferior goods and/or obtain them from higher-cost local sources. Interferences in the interregional allocation of factors of production ensure that producers use higher-cost methods of production and/or that production takes place in higher-cost locations. This is simply

a rendition of the familiar argument concerning the gains from trade.

The main difficulty with the argument is that it can be guaranteed to hold only in the absence of any other imperfections in competitive market forces. Once some imperfections exist, the introduction of other imperfections, such as violations of the common market principle, might actually improve rather than reduce the efficiency of resource allocation. This is what is known as the 'theory of second-best' (see Lipsey and Lancaster 1956-57). Since there undoubtedly exist many competitive market imperfections in the Canadian economy, the concept of 'second-best' might seem to constitute a serious blow to the theoretical underpinnings of the argument for non-interventionist economic policies. However, it would be incorrect to use this concept as a justification for regionally discriminatory policies that would weaken the Canadian common market. This is true for two reasons, the first having to do with the dynamics of protectionism and the second with the question of optimal second-best policies.

While it might be true that, in the presence of existing market imperfections, a particular set of violations of the common market principle would improve economic efficiency, the introduction of the appropriate discriminatory policies would almost certainly lead to further such policies. Restrictions of interprovincial trade or interregional factor movements often have the effect (whether real or perceived) of benefiting groups in one province at the expense of residents of other provinces. If Ontario succeeds in inducing an automobile manufacturer to set up a plant in Ontario rather than Quebec, this might be viewed as a gain for the workers or taxpayers of Ontario at the expense of similar people in Quebec. It would be natural for the government of Quebec to escalate its protectionist policies to make up for this loss. Both governments would be engaging in what are known as 'beggar-my-neighbour' policies. The tendency of protection to breed further protectionist policies has been demonstrated over and over again throughout the world. The set of discriminatory policies that are in place when all the dust has settled will be much different from those that initiated the process. There is little reason to expect that they would resemble the sorts of policies that might have been justified on second-best grounds.

Even if it were possible to justify a set of protectionist policies on these grounds, there would almost always be superior policy instruments available for the purpose. In general, the optimal second-best policy is one that is closely connected with the existing market imperfections. For

instance, if some sort of dynamic external effects resulted in underinvestment in some particular local activity, trade restrictions intended to protect that activity might increase efficiency. However, the optimal second-best policy would be to subsidize the externality-generating activity directly. Any other policy, in addition to stimulating the desired activity, would also have harmful side-effects, such as raising costs to local consumers. The only type of market imperfection for which regionally discriminatory policies would be the optimal second-best tool would be those of an inherently regional nature - imperfections that distorted the interregional allocation of resources. The remainder of this section examines several possible causes of such regional distortions and the appropriate policies for dealing with them.

Fiscally induced migration externalities[6]

People and other mobile factors of production tend to move from one region to another if they expect to make themselves or their owners better off by doing so. The gains from such movement depend not only on interregional differences in factor prices but also on the fiscal activities of governments. Low tax rates and/or high levels of public services tend to increase the attractiveness of a province as a place to live (or invest). To the extent that interprovincial migration or investment decisions are affected by differences in the net fiscal benefits from government activities, the interprovincial allocation of resources is inefficient - this is an imperfection in the market process. Such distortions can arise for a variety of reasons. They can be shown most simply by analysing only the interprovincial allocation of labour.

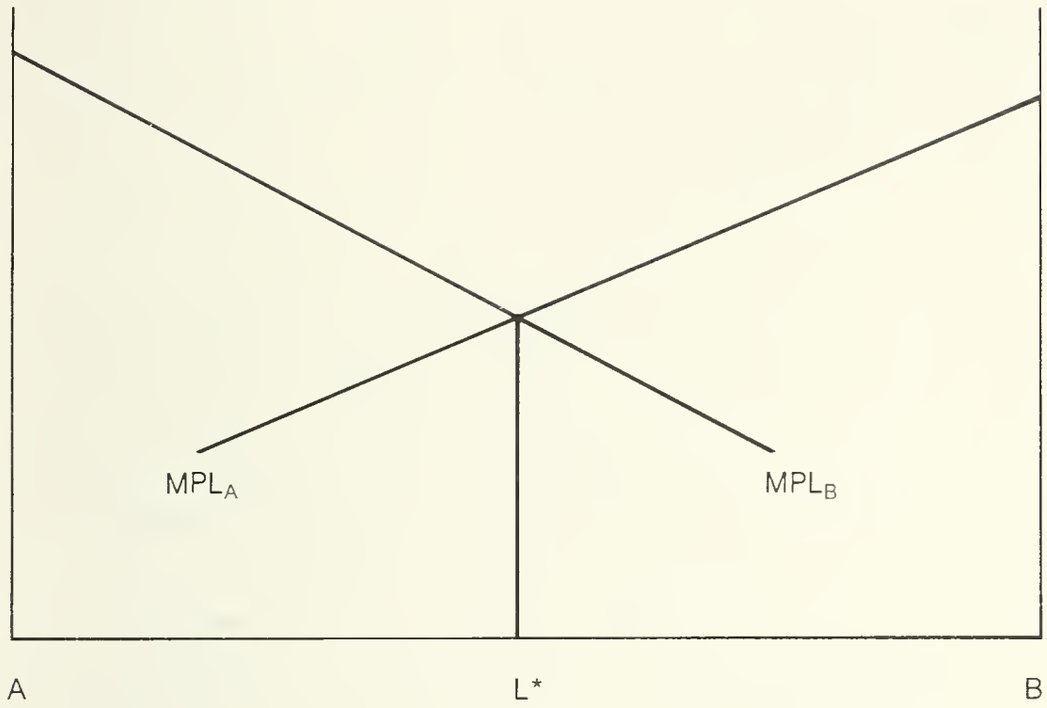
First consider a case in which there is no fiscal externality associated with migration. Suppose that provinces provide their citizens with services that are just like ordinary private goods - increased use of the good by one citizen reduces the amount available to other citizens by exactly the amount of the former's increased consumption. Suppose further that the provision of services in each province is financed by taxes on its residents and that each person's share of the total tax bill is exactly equal to the share of the services he consumes - i.e., there is a system of benefit taxation. Now consider the decision to migrate. If we disregard other influences on migration, such as the costs of moving,[7] migration between two provinces A and B will proceed until

$$w_A + g_A - t_A = w_B + g_B - t_B, \qquad (1)$$

where w_i, g_i, and t_i are, respectively, the wages received, provincial services consumed, and provincial taxes paid by a worker if he resides in province i. However, since there is a system of benefit taxation in each province, g - t will be zero in both A and B. Therefore migration will proceed until $w_A = w_B$. Under competitive market conditions, wages paid will be proportional to workers' marginal products, and so interprovincial migration will ensure that the marginal product of labour is equalized between regions. This would constitute an efficient interregional allocation of the nation's labour force, and any interference with the migration process would reduce the nation's production and the welfare of its residents. In Figure 2, the horizontal axis represents the total amount of labour in the nation: the amount in region A is indicated from left to right from A and the amount in region B is indicated from right to left from B. The value of the marginal product of labour in each region (MPL_i) is assumed to decline as the labour force increases. Under the assumptions made here, L* would be both the optimal (efficient) and actual allocation of labour between the two regions.

Now consider some other possible models. First suppose that each province provides services of a kind known as pure provincial public goods.[8] These are goods whose total production is consumed by all residents of the province; additional residents can consume the same amount as everyone else without detracting from anyone's consumption or requiring any additional output of the good. Light signals from a lighthouse and national defence are often given as examples of the sort of good under discussion here.[9] In such a world, there would be a fiscal advantage to living in a large province. The larger the population of a province, the smaller would be the cost per person of providing a given level of the public good. A large province would continue to grow through migration until the wage in the province fell sufficiently to counteract the fiscal advantage of the lower tax price of public goods. The market imperfection in this situation would arise from the fact that migrants had no incentive to take into account the effects of their migration on the residents of either the sending or the receiving region. The sending region would bear a cost equal to the taxes that the migrant had paid, while the receiving region would receive a benefit equal to the reduction in the tax burden of the original residents as a result of the additional taxes paid by

Figure 2



the migrant. Only in the unlikely case that the per capita tax payments were equal in the two regions would these externalities be offsetting and the interprovincial labour allocation be optimal. This public good externality would be an example of a market imperfection that was regionally specific and might well call for some violation of the common market principle. The optimal second-best policy in this case would be one that interfered with the free interprovincial migration of labour. However, before I discuss the kinds of policies that might be appropriate, it will be useful to consider some other sources of such market imperfections.

In the following three cases, it is assumed that provincial governments provide services of a private-good nature and distribute them in equal amounts to all residents. Each case involves a different assumption about how these services are financed. In the first case, it is assumed that provincial services are paid for out of source-based taxes on immobile property in each province; this property is owned, at least in part, by non-residents of each province. (Examples of such provincial revenue sources are corporation income tax and revenues from natural resources - royalty payments, sales of crown leases, etc.) A fiscal system of this type clearly violates the principle of benefit taxation. The residents of a

province obtain a positive net fiscal benefit (NFB) from their government, since they are able to export the provincial tax burden to non-residents. The size of this NFB will depend on the per capita tax collections of this sort, and will vary from province to province with differences in endowments of taxable resource rents or other property income. In this case, the equilibrium condition for interprovincial migration which corresponds to equation (1) above would be:

$$w_A + s_A = w_B + s_B, \qquad (2)$$

where s_i represents per capita source-based tax collections in province i. The marginal product of labour will differ between provinces by the difference in per capita source-based tax collections. Workers are induced to move not only by interprovincial differences in their labour productivity, but also by discrepancies in their ability to benefit from publicly collected resource rents.

Since 1973, this fiscal externality has become very large in Canada. Recent estimates suggest that a person living in Alberta rather than Ontario enjoys a fiscal advantage on the order of $4,500 per year (an advantage due largely to the difference between the two provinces' resource revenues). For an 'average' family (of 3.5 persons), such an incentive would induce migration into Alberta until all other rewards of living there (wages plus all other amenities) were $15,750 less than the rewards of living in Ontario. Although it is possible to dispute the accuracy of these estimates, it is undeniable that the fiscal distortion is very large and that considerable deviation from the common market principle would be necessary to counteract its effects on the interregional allocation of resources in Canada.

For the next example, suppose that provincial governments do not raise revenues from source-based taxes. Instead, all revenues are derived from taxation of the incomes of local residents. Moreover, instead of assuming, as we did earlier, that these taxes are proportional to benefits received from provincial expenditures, assume that taxes are proportional to income. Since expenditures are assumed to be distributed in equal per capita amounts, this makes the overall provincial fiscal systems progressive: people with above-average incomes receive negative NFBs from their provincial governments, while those with below-average incomes receive positive NFBs. Even though the sum of the NFBs in any province must add to zero, there will still be differences in NFBs between provinces for

any individual (unless the distribution of incomes is identical in each province). Consider a simple example. Suppose that there are two types of workers, skilled and unskilled, and that initially skilled persons are paid $20,000 and unskilled persons $10,000 in each province. Suppose as well that province A has twice as many skilled workers as unskilled workers, while the proportions are exactly reversed in province B. Then if each province provides public services financed by a proportional income tax at a rate of 10 per cent, the NFBs for each type of worker in each province are as shown in Table 1. Both skilled and unskilled workers have a fiscal incentive of $333 to move from B to A. This is because under a progressive fiscal system NFBs to all residents rise with the average level of income. Unless economic efficiency required identical distributions of workers in all provinces - a highly unlikely event, given the interprovincial differences in economic structures in Canada - this situation would be another source of fiscally induced distortions in the interregional allocation of resources. The size of the distortion would depend on the degree of progressivity of provincial fiscal structures, the size of provincial income tax rates, and the magnitude of per capita income differences between provinces.

In the examples so far it has been assumed that all provincial governments behave in a similar fashion. The fiscal externalities arise from differences in the structural characteristics of the provinces, such as size, resource endowments, and average income levels. In the final example, the assumptions are reversed. Provinces are assumed to have similar economic structures, but provincial governments are assumed to behave differently. In particular, it is assumed that one province has a more progressive fiscal structure than the other. For simplicity, suppose that each province has equal numbers of skilled and unskilled workers earning $20,000 and $10,000 respectively, and that province A taxes according to the benefit principle while province B has a progressive fiscal system identical to that in the previous example. In province A, all workers receive zero NFBs from their provincial government, while, with a 10 per cent tax rate, the skilled and unskilled workers in province B receive NFBs of -$500 and +$500 respectively. Now the unskilled workers have a fiscal incentive to migrate from A to B, while skilled workers face the opposite fiscal incentive. In general, ceteris paribus, when the redistributive behaviour of two provincial governments differs, there is a fiscally induced distortion encouraging excessive migration of rich persons to the

TABLE 1
Net fiscal benefits with identical progressive fiscal systems

	Skilled	Unskilled
Province A	-333	+666
Province B	-666	+333

province with the less progressive fiscal system and of poor persons in the opposite direction. Once again there would appear to be ample justification for violating the common market principle.

What all of these examples demonstrate is that the independent behaviour of provincial governments in a decentralized federal system is almost certain to give rise to distortions in the interregional allocation of the nation's resources. These distortions do not arise from consciously discriminatory behaviour on the part of provincial governments; they are inherent in a federal system of government. They can be caused by: (i) differences in size (the public good externality in the first example), (ii) differences in resource endowments (the rent-induced migration in the second example), (iii) differences in average income levels (the redistributive provincial budget externality in the third example), and (iv) differences in provincial policy preferences (the redistributive budget externality in the fourth example). The importance of these market imperfections depends on both the size of the distortion and the responsiveness of affected factors of production to the incentive it provides. While the public good externality is too small to be of great significance, the resource rent externality is undoubtedly quite large. In Canada, the size of the residence-based tax externalities lies somewhere between these two extreme cases. As to the responsiveness of factors of production to fiscal incentives, recent empirical studies of migration (Gauthier and Winer 1982, Foot and Milne 1981) confirm the existence of the effects postulated in these simple models.

How is the economic case for the Canadian common market affected by these fiscal distortions? Clearly, regionally discriminatory policies that counteracted the effects of the distortions would increase the efficiency of resource allocation in Canada. Let us consider some of the possibilities. First, one can imagine a wide range of policies at either the federal or provincial level that would reduce interprovincial factor mobility. Examples of such policies are: residency requirements for the use of provincial

services; non-portability of pensions, unemployment insurance benefits, and other social benefits; non-deductibility of moving costs, local labour hiring preferences; and occupational licencing laws. Of course, if all factors of production were completely immobile there would be no inefficient fiscally induced migration. The problem with all such policies is that they would also make the economy unresponsive to changes in technology, resource discoveries, and the external environment - changes that require shifts in resource allocation if the economy is to take advantage of them. It would be very difficult for governments at any level to design a system of mobility restrictions (or subsidies if so required) that exactly compensated for the inefficiencies of fiscally induced migration and yet did not interfere with responses to real market signals. It is even more difficult to imagine what incentive governments - especially provincial governments - would have to use such policies in this manner, assuming they had the power to implement them.

A second possibility would be to reduce the fiscal powers of provincial governments. One way to do it would be to restrict the legal power of provincial governments to collect revenues from resource rents and to use their budgets to redistribute income. Alternatively, the federal government could use its tax system to nullify any differences in provincial budgetary policies, making the total redistributive impact of the federal and provincial fiscal systems the same across provinces; this would involve the imposition of higher federal tax rates in provinces with excessive resource rents and the use of a different personal income tax rate structure in each province. Just to describe these policies is to demonstrate their unacceptability and their incompatibility with a federal system of government such as Canada's.

A third possibility would be to introduce a system of intergovernmental transfers that narrowed or even eliminated the differences in the capacities of the provinces to provide net fiscal benefits for their citizens. This solution, a system of equalization payments, is the one that has been chosen in Canada. A properly designed system of equalization payments is an excellent way of preserving the autonomy of provincial governments while reducing all but the last of the fiscal distortions described above. If provinces differ in their redistributive behaviour, no unconditional fiscal transfer from one province to the other can eliminate the distortions illustrated in our simple example. It can reduce the inefficient fiscal incentives facing one group only by increasing those facing some other group.[10]

Nevertheless, as long as provincial governments do not differ very much in their redistributive behaviour, a proper equalization scheme will eliminate most of the fiscal distortions arising from decentralized provincial behaviour. In this respect at least, the economic argument for preserving the common market is very strong. Unfortunately, the current Canadian program of equalization transfers is deficient in several respects.[11] From the viewpoint of Ontario, the program's two most important defects are that it is not a net scheme and that it does not adequately equalize resource revenues. The principal effect of these problems is to make Ontario much less fiscally attractive as a place to reside or invest than it ought to be for the efficient allocation of the nation's resources through competitive market forces. Unfortunately, there is very little that Ontario can do on its own to rectify this situation. In particular, it is hard to think of anything Ontario could do in this regard by virtue of having control of its own personal income tax.

Regional unemployment problems[12]

Virtually all federal systems, and other types of economic union, permit violations of the common market principle for purposes of employment creation in their poorer regions. Regional disparities in unemployment are large in Canada; in 1979, the highest and lowest provincial unemployment rates were 18.4 per cent in Newfoundland and 3.0 per cent in Saskatchewan. These differences are of understandable concern to the provinces with the higher rates. Yet the introduction of trade barriers to foster jobs at home is unlikely to be an effective way of dealing with the problem. Two important reasons may be mentioned.

First, only the federal government is large enough on its own to significantly influence total demand in Canada (which it does through its monetary and fiscal policies). What an individual province can attempt through trade restrictions is to shift demand towards itself and away from other provinces - a beggar-my-neighbour policy. As I pointed out earlier, such policies have a hope of working only if other provinces passively allow the resulting shifts in demand to occur. If they take similar action, the resulting round of trade restrictions reduces interprovincial trade and brings no significant gains in employment to any one province, since all the 'buy at home' policies are mutually cancelling.

But this is not all; there is a second force operating as well. Even

if other provinces are willing to forgo retaliation and let one province shift demand to its home market, unemployment may not be reduced. The unemployment may be the result of strong natural economic forces that will not yield to such a simple-minded policy measure as raising local demand.

How might unemployment of this sort come about? Say that province A, despite its physical and climatic attractions, has a set of natural endowments that will not produce as high an income as the less attractive province B. There are two major ways in which markets can adjust to such differences in regional employment opportunities. First, if people choose to live in province A because of migration costs or a taste for local amenities, in spite of having lower incomes, in a flexible market real wages and income will fall in province A for those kinds of workers who are in excess supply. The cheapening real wages of some kinds of labour will give the province an advantage in some new lines of production. Real wages will continue to fall until everyone who is willing to stay at the lower wages has a job and those who are not have migrated. In the steady state, province A is a low-wage, low-income province, but it has no significant unemployment problem.

The second way in which the market can adjust is the more common one today, reflecting the fact we do not have fully flexible wages. Minimum wage laws, national unions, and nation-wide pay scales for the federal civil service put substantial restraints on interprovincial wage differentials. The same forces work in this case as in the previous one, but they express themselves in unemployment. People who prefer province A stay in A, but wages do not fall to create new avenues of economic advantage. Instead, unemployment rates rise until the extra uncertainty of finding a job and the lower lifetime income expectations because of bouts of unemployment just balance both the superior amenities that province A enjoys and the costs of moving from province A to province B. In the steady state, those who are willing to stay in spite of the higher unemployment remain while the others leave. In these circumstances, increasing local demand, even where that is possible, will <u>not</u> lower unemployment: as new jobs are created, the rate of outmigration slows and the rate of unemployment is unchanged. This is so because in the steady state the rate of unemployment must remain high enough to balance the relative amenity and migration-cost advantage that province A enjoys over province B when wages are the same in both areas. In these circumstances, trade restrictions or labour market policies such as employ-local-labour-only laws or

employment subsidies will not reduce unemployment, although they will increase employment.

Labour market policies cause inefficient use of labour by discouraging workers in high unemployment areas from moving to regions of low employment. Policies designed to shift demand for goods to the high unemployment areas restrict the movement of goods. This reduces total national demand by reducing the size of the tariff-free local market on which much economic activity depends.

The danger to the common market is that, far from reducing unemployment, the increasingly severe application of such measures would reduce the volume of trade and further fragment the national market. Even in the absence of cumulative retaliation, the cost of regional employment policies would be far from negligible. Again, new job creation in a region of high unemployment causes a roughly similar reduction in migration to regions of greater economic opportunity. In effect, therefore, new jobs are filled, not by the unemployed, but rather by people who otherwise would be employed in regions of higher productivity.

It seems indisputable that if Canadian provinces had restricted interprovincial labour movements in the past, unemployment disparities would now be much higher than they are. The major guarantee of the maximum chance of a job for Canadians in a changing world clearly lies in the free movement of labour and goods throughout the country and in measures to stimulate employment in buoyant industries wherever they may be located in the country. Attempts to preserve local jobs and restrict factor movement are a poor second-best policy. Regional unemployment problems do not provide a serious qualification to the case for the Canadian common market.

Summary

There are few forces of a legal-constitutional or a political nature to protect the Canadian common market. To the contrary, there seem to be strong political forces at both the federal and the provincial levels working to violate the common market principle. Regionalized 'industrial policies' are an important current manifestation of these forces. In the circumstances, the degree of tax harmonization that has been achieved in Canada since the Second World War is really quite surprising. However, it may simply reflect the abundance of alternative policy tools available for the

achievement of localized policy goals.

The economic case for preserving and strengthening the Canadian common market is based on the gains from trade and the responsiveness of resource allocation to changes in competitive market forces. Market imperfections of a strictly regional nature would be the only serious source of weakness in the economic argument. While regional unemployment problems are not likely to weaken the case for the common market, a regionally discriminatory intergovernmental transfer program in the form of a properly designed system of equalization payments is necessary to reap the economic advantages of interregional factor mobility. The current equalization program is deficient in several respects and has the net effect of providing excessive discouragement to those who wish to reside or invest in Ontario. However, the violations of the common market principle that might be made possible by Ontario's adoption of its own PIT would be unlikely to improve the efficiency of the nation's allocation of resources.

QUANTIFICATION OF REGIONAL DISTORTIONS IN THE CANADIAN COMMON MARKET

Quantification of the importance of distortions in the regional allocation of resources involves at least two distinct exercises: the identification of the relevant market imperfections and the estimation of their cost to the Canadian economy. Until quite recently, work on the first of these problems for the post-war period in Canada was mainly of an anecdotal nature, while the second problem had not even been tackled. Owing in large part to the recent constitutional discussions, some progress has now been made on both fronts. This section of the paper provides a brief critical overview of this work.

Since the work of the Rowell-Sirois Commission in 1940, the first significant attempt at systematic identification of regional barriers to trade and factor flows in Canada was that of Safarian (1974). More recent studies include those by Shoup (1977), Chrétien (1980), Maxwell and Pestieau (1980), Trebilcock et al. (1981), Whalley (1981a,b), and Davenport et al. (1982). Most of these studies present long lists of interprovincial barriers, often broken down according to whether they affect trade in goods, capital, or labour, and then argue that the length of the lists demonstrates a serious trend towards balkanization of the Canadian economy. Superficially, at least, the arguments are quite compelling.

Among what seem to be the more important distortions are various forms of regional 'industrial policies' ('province-building' activities), federal social and adjustment programs, and the purchasing policies of provincial governments and especially of their crown corporations. In addition, a relatively well-informed reader can almost always discover some significant distortions that have been overlooked by the compilers of these catalogues of market imperfections. On the other hand, a close examination of many of the lists will usually turn up some alleged barriers that exist as yet only in the minds and words of some policymakers. Politicians seem to make a practice of threatening (or promising) to implement various policies without ever actually doing so. However, the existence of such threats could also be taken as confirmation of a trend to escalating wars of protection and discrimination.

But what is the quantitative importance of these barriers? Most studies of the efficiency costs of market imperfections in the context of the fields of public finance and international trade come up with estimates that are not generally considered to be very large. For example, Wonnacott (1975) and Harris (1982) estimate that the cost of tariffs to Canada is between 5 and 10 per cent of GNP. While these might not seem to some to be very large numbers, even the lower figure is still three-quarters of the entire budget of the government of Ontario. A large part of this efficiency cost arises from the loss of economies of scale (e.g., long production runs and specialization in product lines) that occurs with protection of the domestic market. Whalley (1981a, b) estimates that interprovincial trade in Canada is quantitatively similar to Canada's volume of international trade, and of course each of the provincial markets is considerably smaller than the national market. One might be tempted to reason by analogy that if each province interfered with interprovincial trade as much as the national tariff does with international trade, this might reduce Canadian GNP by much more than the national tariff reduces it. Hazledine (1979) examines the costs of (hypothetical) interprovincial trade barriers that would exist if the Canadian customs union were destroyed by the separation of certain provinces. (He does not consider the effects of any barriers to factor movements.) His results are in broad conformity with what might be expected from similar studies of the costs of tariffs in international trade.

The only attempts that have been made to estimate the costs of existing distortions in interprovincial trade and factor flows in Canada have

been those of Whalley (1981a, b) and Trebilcock et al. (1981). They find the costs to be really quite low. While these authors are to be congratulated on their pioneering work, there are many weaknesses in it. Both they and others (Courchene 1981) are fully aware of many of these weaknesses, three of which should be noted here. First, their identifications of existing distortions suffer from both the inclusion of some items that do not constitute distortions and the exclusion of many true imperfections. The most notable item in the first category is federal equalization transfers. As I suggested earlier, it is interprovincial differences in NFBs from government budgets that is the true distortion, and the existing equalization program is an (incomplete) offset to it. Second, many of the existing distortions are very difficult to quantify. These include those which are considered to be among the more important ones, such as the purchasing policies of provincial governments and crown corporations and the effects of investment subsidies on interprovincial factor flows. Third, the models upon which the cost estimates are based suffer from an inability to take into account economies of scale or any dynamic effects. This, of course, is a criticism that is common to almost all studies of this type. Harris (1982) is one of the first systematic attempts to include scale effects in the estimation of the costs of protection.

It is necessary to conclude, therefore, that we are still a long way from having a firm idea of the efficiency costs of distortions in the interprovincial flows of goods and factors of production in Canada.

CONCLUSION

The main conclusion that emerges from this discussion is that there would appear to be no significant economic advantage from a national or a provincial viewpoint to Ontario's opting out of the tax collection agreement and adopting its own PIT. Since Ontario has considerable flexibility under the current arrangements, and has many other policy weapons already available in its arsenal, it is difficult to predict whether 'going it alone' would add significantly to existing distortions to the Canadian common market. The main effect of threatening to withdraw or actually withdrawing from the agreement might well be to improve the federal-provincial consultative mechanism for the design of the Canadian tax structure. The benefits from improvements in this area could be considerable. Aside from this, there is no economic case for 'going it alone'.

NOTES

1 See L. Grossman (1980) for instance.
2 According to the Financal Post (12 June 1982), Quebec has declared all federal MPs from Quebec to be residents of Quebec for tax purposes, even if they have taken up residence in Ottawa while serving in Parliament.
3 See the Boadway and Bruce study in this volume.
4 See Flatters and Lipsey (1981) for a more thorough description of this phenomenon in this particular context.
5 This and the next two sections are to a large extent a summary of material from Flatters and Lipsey (1981).
6 See Boadway and Flatters (1982a,b) for a more complete discussion of the issues summarized in this section.
7 Boadway and Flatters (1982c) show that the introduction of migration costs does not affect the results of this analysis.
8 This discussion is based on Flatters, Henderson, and Mieszkowski (1974).
9 The introduction of some amount of congestion, so long as it is not sufficient to render the good a pure private good, would not alter the analysis in any fundamental way. See Flatters, Henderson, and Mieszkowski (1974).
10 Of course, if only skilled workers were interprovincially mobile, a transfer from the province with the less progressive fiscal system to the one with the more progressive system would have the right effect.
11 See Boadway and Flatters (1982b), Boadway, Flatters, and Leblanc (1982), and Economic Council of Canada (1982) for further discussion.
12 Some of the issues in this section are discussed in much greater detail in Boadway and Flatters (1981).

REFERENCES

Abonyi, A., and F. Flatters (1982) 'Problems of industrial policies in a small open economy: an overview of Canada.' Mimeograph, Kingston

Boadway, R. (1982) 'On the method of taxation and the provision of local public goods: comment.' American Economic Review 72, 846-51

Boadway, R., and N. Bruce (1984) 'The PIT, savings, and investment.' In the present volume.

Boadway, R., and F. Flatters (1981) 'The efficiency basis for regional employment policy.' Canadian Journal of Economics 14, 58-77

- (1982a) 'Efficiency and equalization payments in a federal system of government: a synthesis and extension of recent results.' Canadian Journal of Economics 15, 613-33

- (1982b) Equalization in a Federal State: an Economic Analysis (Ottawa: Economic Council of Canada)

- (1982c) 'Financing confederation: a rejoinder.' Canadian Public Policy 8, 62-3

Boadway, R., F. Flatters, and A. Leblanc (1982) 'Revenue sharing and the equalization of natural resource revenues.' Canadian Public Policy 9, 174-80

Canada, Department of Finance (1981) Economic Development for Canada in the 1980s (Ottawa: Queen's Printer)

Courchene, T. (1981) 'Historical and analytical perspectives relating to the Canadian economic union.' Paper prepared for the Conference on Federalism and the Canadian Economic Union, London, Ontario. A revised version of this paper appears in Trebilock, M.J., J.R.S. Prichard, T.J. Courchene, and J. Whalley (1983) Federalism and the Canadian Economic Union (Toronto: Ontario Economic Council)

Chrétien, J. (1980) Securing the Canadian Economic Union in the Constitution (Ottawa: Supply and Services Canada)

Davenport, R., et al. (1982) Industrial Policy in Ontario and Quebec (Toronto: Ontario Economic Council)

Economic Council of Canada (1982) Financing Confederation Today and Tomorrow (Ottawa: Economic Council of Canada)

Flatters, F., V. Henderson, and P. Mieszkowski (1974) 'Public goods efficiency and regional fiscal equalization.' Journal of Public Economics 3, 99-112

Flatters, F., and R. Lipsey (1981) Common Ground for the Canadian Common Market (Montreal: The Institute for Research on Public Policy)

Foot, D., and W. Milne (1981) 'Public policy and interprovincial migration in Canada: an econometric analysis.' Paper presented to the Canadian Economics Association Meetings, Halifax

Grossman, L. (1980) 'Constitutional renewal requires a Canadian common market.' Policy Options 1, 9-11

Harris, R. (1982) 'Industrial organization and the general equilibrium costs of protection in small open economies.' Mimeograph, Kingston

Hazledine, T. (1979) 'The economic costs and benefits of the Canadian federal customs union.' In Proceedings of the Workshop on the Political Economy of Confederation (Ottawa: Economic Council of Canada)

Lipsey, R., and K. Lancaster (1956-57) 'The general theory of second best.' Review of Economic Studies 24, 11-32

Maxwell, J., and C. Pestieau (1980) Economic Realities of Contemporary Confederation (Montreal: C.D. Howe Research Institute)

Naylor, R. T. (1975) History of Canadian Business 1867-1914 (Toronto:

James Lorimer and Co.)

Ontario (1982a) Ontario Budget: Budget Statement (Toronto: Queen's Printer)

- (1982b) 'Ontario tax structure: options for change.' Budget Discussion Paper

Safarian, A.E. (1974) Canadian Federalism and Economic Integration (Ottawa: Information Canada)

Shoup, C. (1977) 'Interregional economic barriers: the Canadian provinces.' In Intergovernmental Relations (Toronto: Ontario Economic Council)

Starrett, D. (1980) 'On the method of taxation and the provision of local public goods.' American Economic Review 70, 380-92

Trebilcock, M., et al. (1981) 'Provincially induced barriers to trade: a descriptive and evaluative survey.' Paper prepared for the Conference on Federalism and the Canadian Economic Union, London, Ontario. A revised version of this paper appears in Trebilcock, M.J., J.R.S. Prichard, T.J. Courchene, and J. Whalley (1983) Federalism and the Canadian Economic Union (Toronto: Ontario Economic Council)

Whalley, J. (1981a) 'Federally and provincially induced distortions of interprovincial activity: an overview of issues.' Paper prepared for the Conference on Federalism and the Canadian Economic Union, London, Ontario. A revised version of this paper appears in Trebilcock, M.J., J.R.S. Prichard, T.J. Courchene, and J. Whalley (1983) Federalism and the Canadian Economic Union (Toronto: Ontario Economic Council)

- (1981b) 'The impact of federal policies on interprovincial flows of goods and factors.' Paper prepared for the Conference on Federalism and the Canadian Economic Union, London, Ontario. A revised version of this paper appears in Trebilcock, M.J., J.R.S. Prichard, T.J. Courchene, and J. Whalley (1983) Federalism and the Canadian Economic Union (Toronto: Ontario Economic Council)

Winer, S.L., and D. Gauthier (1982) 'Internal migration and fiscal structure: an econometric study of the determinants of interprovincial migration in Canada.' A study prepared for the Economic Council of Canada (Ottawa: Supply and Services Canada).

Wonnacott, R.J. (1975) Canada's Trade Options (Ottawa: Economic Council of Canada)

Policies Toward Tax Harmonization

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In a federal state, the federal government's desire to establish uniform living conditions for all citizens frequently clashes with the desire of other levels of government for a large measure of fiscal autonomy. Equality is not easily reconciled with diversity. Tax harmonization is the subject of a small but growing body of literature that seeks a basis for such a reconciliation.[1]

The purpose of this paper is to survey the economic literature dealing with tax harmonization and to relate it to Ontario's recent decision to investigate the desirability of establishing a separate personal income tax system. The survey is organized around the various conceptual themes that emerge from the studies it examines. Thus the first section below draws on the literature in an attempt to define the proper scope of tax harmonization and its relationship to other economic issues. The second section explores in greater detail some of the issues that derive from the attempt to define tax harmonization. Specifically, it raises the question of exactly what fiscal variables should be harmonized in a federal system. The third section discusses the range of techniques that are available for harmonizing the fiscal systems of federal countries. The fourth section is concerned with where Canada stands in its choice of approaches to tax harmonization vis-à-vis the experience and current practices of other federal countries. The fifth section evaluates Canada's current posture towards tax harmonization. The sixth section discusses some of the implications for Ontario of its possible withdrawal from the tax collection agreements for the personal income tax. The final section provides a brief summary of this review of the literature and offers some conclusions.

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WHAT IS TAX HARMONIZATION?

Tax differentials often distort the allocation of resources within a federal economy. Consequently, it is possible to invoke the goal of economic efficiency as grounds for their removal. Measures to harmonize taxation in a federal system are often defined as efforts to reduce or eliminate the impact of interjurisdictional tax differentials.[2] Because tax harmonization may restrict and constrain the taxation policies of subfederal governments, it is often seen as a thrust towards economic centralization. Moreover, because it focusses almost exclusively on the efficiency objective, tax harmonization is considered important by those who want to preserve a common market for the unimpeded flow of commodities and factor services across jurisdictional boundaries. In addition, since some of the restrictions imposed on subfederal governments may deny them access to certain tax bases, tax harmonization policies are closely related to the assignment problem in federal economies - that is, the question of the appropriate distribution of taxation powers among the several levels of government.

While the emphasis on tax differentials is not entirely misplaced, it can be argued that it involves too narrow a conception of the tax harmonization issue. A primary justification for a federal system is that it permits and encourages different expenditure choices by different subfederal governments. The imposition by a unitary government of a uniform level of expenditure across the country would be an inefficient fiscal arrangement if there were significant regional variation in preferences for public sector services. A unitary system of government seems to work best where there is substantial homogeneity among the population. In Sweden, for example, where this condition is presumably met, a unitary form of government makes considerable sense. A country with significant minorities or a heterogeneous mix of cultural and ethnic groups is likely to favour a federal system of government. Seen in this light, the role of tax harmonization policies is to preserve expenditure diversity among subfederal units of government while minimizing the distorting influence of the non-uniform revenue systems that these governments may put in place. Tax harmonization policies, according to this view of the matter, protect the freedom of subfederal units of government to choose their expenditure patterns and levels while encouraging them to avoid inefficient methods of taxation. An alternative view of tax harmonization is that it seeks an optimum balance between efficiency on the expenditure side of government

budgets and inefficiency on the tax side. That is, some forms of taxation by subfederal governments may be so inefficient as to warrant restrictions on the taxation powers of these governments even though the restrictions may constrain the expenditure choices that the governments would otherwise make. In this event, tax harmonization is felt to produce a net gain for the economy since any reduction in expenditure efficiency is outweighed by the gain in tax efficiency.

If the task of tax harmonization is taken to be the preservation of expenditure diversity in a federation, it can hardly be said to be inconsistent with fiscal decentralization. On the other hand, if tax harmonization is seen as an attempt to achieve a balance between expenditure efficiency and tax inefficiency, the centralizing tendencies of many harmonization measures become more apparent. This bias towards centralization derives from the fact that the efficiency objective is necessarily a nationwide goal and the pursuit of such a goal may conflict with the realization of the objectives held by subfederal governments.[3] The greater the weight that is attached to the realization of the efficiency objective, the more likely it is that constraints will be applied to the fiscal behaviour of subfederal fiscal bodies.

Since expenditure policies, in particular subsidy programs, are often close substitutes for a variety of tax measures, the effects of harmonized tax policies may be effectively repealed by unharmonized expenditure programs. Therefore, the notion of fiscal harmonization - of accounting for the effects of both expenditures and taxes on the allocation of resources in an economy - is a much more important consideration than tax harmonization by itself. As I have emphasized elsewhere (Thirsk 1980, 1981, 1983), it is the net fiscal residual, the difference between expenditure benefits received and taxes paid by individuals and firms, that should be harmonized or made more uniform in a federation if the efficiency objective is to be fulfilled.[4] By itself, tax harmonization offers very little policy appeal unless one believes that expenditure policies are highly imperfect substitutes for various tax measures.

When different levels of government resort to taxing the same tax base, the need for vertical tax harmonization arises. Only some type of tax coordination between levels of government will keep the administrative and compliance costs of tax collection in check. One solution to this problem is to assign separate sources of taxation to different levels of government. However, this solution may not be attractive if excessive use

of a particular base results in larger efficiency losses than a more broadly based tax system would produce.

The problem of coordinating the revenue systems of governments at the same jurisdictional level is the concern of horizontal tax harmonization. The problem is complicated by the fact that many individuals and firms conduct their economic activities in more than one subfederal jurisdiction. Under these conditions, some income flows may face either multiple taxation or no taxation whatsoever. In either case, the ability of a country's fiscal system to achieve both efficiency and equity will be impaired.

WHAT VARIABLES SHOULD BE HARMONIZED?

The harmonization of disparate tax systems may involve either agreement on a uniform definition of the tax base or acceptance of a common rate of taxation. In the attainment of tax systems that do not interfere with trade flows and resource allocation, the harmonization of tax bases is logically prior to the harmonization of tax rates. Unless there is substantial inter-jurisdictional uniformity among tax bases, effective rates of taxation will diverge even though nominal tax rates may be the same. Since differences in effective rates are what affect resource allocation, there is nothing to be gained by harmonizing tax rates unless the bases to which these rates apply are initially the same. Conversely, comparisons of nominal tax rate differences are highly misleading indicators of the degree of disharmony when the definition of the tax base varies widely across jurisdictions. For example, although marginal personal income tax rates in Quebec are on average noticeably higher than they are in other provinces, the more generous system of deductions in that province may make effective income tax rates there no higher than they are elsewhere. It would appear, therefore, that as long as the definition of the tax base varies widely across jurisdictions, no agreement on tax rates would remove tax disparities and their effect on the allocation of resources. Moreover, and more obviously, there are substantially higher administrative and compliance costs of taxation for both individuals and firms when they must file tax forms in each jurisdiction in which they are taxable.

Closely related to the issue of the appropriate target for harmonization is the question of which tax differentials are likely to distort the allocation of resources. At least two instances can be identified in which non-uniform taxes would <u>not</u> encourage economic waste.

If in financing public services provinces relied much more heavily than they do on benefit forms of taxation, giving their residents a quid pro quo for their tax payments, tax differences would reflect different provincial preferences for the consumption of publicly provided goods and services. Under these circumstances, provincial tax systems would not redistribute incomes either within or among provinces. However, this model of subfederal finance requires that the powers to redistribute incomes rest solely with the federal government. Given the current division of fiscal powers in most federal countries, adoption of this model would in most cases require a significant transfer of powers to the federal government. On the other hand, if subfederal levels of government persist in employing redistributive taxation policies, the search for harmonization measures and concern over the effects of unharmonized tax systems will continue.

If various forms of benefit taxation were used to finance the expenditures of subfederal governments, interjurisdictional tax differences would arise from different preferences for public goods and different cost functions in supplying these public goods. Regional cost functions for public goods might vary because regional production functions for public sector outputs differed or because factor costs differed across regions. However, neither variable tastes nor variable costs would result in a fiscally induced misallocation of resources as long as public sector outputs were paid for by benefit taxes.[5]

Tax harmonization is closely linked with the analysis of tax incidence. As I mentioned earlier, it is the jurisdictional variation in effective tax rates that is the particular concern of tax harmonization. However, in order to determine the effective tax rate on an economic agent, it is necessary to take into account complications arising from the complexity of the tax laws and the interaction of different tax bases, and also the possibility that some agents will be able to shift the burden of the tax onto others. One of the central lessons of the literature dealing with tax incidence is that mobile factors of production may be able to shift their tax burdens onto immobile factors, such as land and some types of labour. In this case, a tax differential imposed on a mobile factor of production, such as capital, would provoke no misallocation of resources since the effective rates of taxation on this agent would remain the same across jurisdictions. The fact that immobile factors of production were burdened with unequal rates of effective taxation would also be of no allocative consequence, since

by definition immobile factors cannot be reallocated across jurisdictions. This consideration enormously complicates the task of harmonization, since some uncertainty will inevitably surround the incidence of a particular tax or tax differential in a given jurisdiction.

As was hinted at before, the expenditure as well as the tax side of government budgets has a bearing on the locational decisions of business firms and individuals. Indeed, what may be achieved on the tax side in terms of reducing locational distortions can easily be wiped out by expenditure policies. The public finance literature clearly shows that taxation and subsidy policies are close substitutes for one another. Anything a tax policy can achieve, a suitably designed subsidy program can also deliver. Consequently, efforts to obtain tax harmonization may have a limited effect unless they are accompanied by measures to achieve harmonized expenditure decisions as well. Therefore, as the recent Parliamentary task force on federal-provincial fiscal arrangements has emphasized, fiscal harmonization is a more attractive policy objective than tax harmonization.[6] Fiscal harmonization would focus on the interjurisdictional variation in the difference between the expenditure benefits that economic agents receive and the amount of taxes that they pay. Differences among jurisdictions in this so-called fiscal residual have the capacity to distort the allocation of resources, since they make locational decisions subject to fiscal as well as productivity influences. The job of fiscal harmonization is to remove or reduce the distorting influence of interjurisdictional differences in the value of the fiscal residual.

Tax harmonization may be viewed as a necessary first step towards the more comprehensive goal of fiscal harmonization. Suppressing the expenditure side, one can draw an important distinction between the tax treatment of individuals and the tax treatment of business firms. Individuals residing in a particular jurisdiction face a variety of tax liabilities. Some of these liabilities will be higher in other jurisdictions and others will be lower, and to some extent these interjurisdictional differences will cancel each other out. Thus lower sales tax rates in one jurisdiction may be offset by higher income tax rates in that area. It is the differences between the <u>total</u> tax package available in the various jurisdictions rather than the differences between parallel components of those packages that affect the individual's location decision, and that are relevant to tax harmonization as far as the individual is concerned. Business firms, on the other hand, do not face such a wide array of taxes. In most jurisdic-

tions, firms are subject only to corporate income and property taxes, and there is much less scope for a low rate imposed on one tax base to offset a relatively high tax rate on a different tax base. Therefore, as far as firms are concerned, it is differentials in tax rates that are important for purposes of tax harmonization.

WHAT ARE THE TECHNIQUES FOR HARMONIZING TAXES?

As the previous section emphasized, the problems of tax harmonization would disappear if subfederal levels of government resorted to only benefit forms of taxation. At the very least, such a step would involve the reassignment of the corporate tax field to the federal government, much greater municipal reliance on user fees for publicly supplied private goods, and, as well, a radical restructuring of the personal income and property tax systems. Such a thorough reconstitution of a country's tax system would be difficult to achieve even in a unitary state. Where numerous jurisdictions are involved, this particular solution to the fiscal harmonization problem, attractive as it is on theoretical grounds, may be considered as utopian for practical policy purposes. On the assumption that subfederal levels of government will continue to engage in redistributive taxation policies, alternative techniques of tax harmonization must be considered. These are discussed below.

Tax separation

The problem of vertical tax harmonization can be solved by the exclusive assignment of different tax fields to the different levels of government. If different levels of government depended entirely on different sources of tax revenue, the problems that inevitably arise with overlapping tax jurisdictions would be avoided. In most federations where this solution has been applied the result has been a highly centralized fiscal system, since the federal level of government has invariably appropriated the more productive tax bases.

In examining what is described as the tax jungle of the 1930s, the Rowell-Sirois Commission recommended that the provinces and the municipalities vacate all of the important areas of direct taxation, including the fields of succession duties and both personal and corporate income taxes.[7] As compensation for this deprivation of fiscal resources, the provinces

would receive adjustment grants based on a formula similar to the one that determines entitlement under the current system of equalization payments. In a sense, a solution of the kind proposed by the Rowell-Sirois Commission takes care of horizontal as well as vertical tax coordination since it drastically reduces the number of tax bases available to subfederal levels of government and, therefore, the number of interjurisdictional tax differentials that can occur. Experience also suggests that, in order to be a workable solution, the option of tax separation must frequently be accompanied by an equalization program that transfers resources from the federal to the subfederal levels of government as well as redistributing regional income. The exigencies of wartime finance forced the acceptance of the Rowell-Sirois solution, and it survived for a dozen years after the end of the Second World War in the form of a tax rental system. The federal government was considered to be renting, temporarily, the direct tax fields that had been constitutionally set aside for the provinces under the BNA Act.

In terms of the efficiency costs of collecting revenues in a federal system, the attractiveness of the tax separation arrangement is more apparent than real. If consumption, for example, is found to be a desirable tax base for both federal and subfederal levels of government, why should it not be occupied jointly by the different levels of government? If subfederal levels of government are excluded from the consumption tax base, they may turn to less efficient tax bases or forgo efficiency-enhancing expenditures altogether. On the other hand, excessive use of a single tax base by more than one level of government may incur larger allocative losses than would be produced by a more broadly based tax system. The point here is that there is no convincing theoretical rationale for favouring a system of tax separation. Each proposal for tax separation would have to be judged on its own merits against alternative methods of securing a greater degree of tax harmonization. In any event, it is unlikely, short of a future national emergency, that Canada will ever return to this solution.

Tax sharing

If some taxes are considered to be suitable for use at several levels, a system of tax sharing will secure both vertical and horizontal harmonization. Under this arrangement, the federal government would collect the

total amount of the shared tax and remit a predetermined portion of it to the provinces on the basis of what each tax yielded in a particular jurisdiction. Because there would be no interjurisdictional tax rate differential, no problems of horizontal coordination would occur, while the adoption of a common definition of the tax base throughout the system would solve the problem of vertical tax harmonization. However, problems might occur on the expenditure side, since there would be no guarantee that the revenue slice allotted to provinces and their municipalities would be sufficient to finance their expenditure needs. Some mechanism would be needed to adjust the proportion in which the revenues were shared according to differences in the rate of expenditure growth at different levels of government.

This approach to tax harmonization was tried briefly in Canada under the 1957 federal-provincial fiscal agreement. In return for the right to collect and impose all income taxes, personal and corporate, as well as estate taxes, the federal government consented to share 10 per cent of the personal income taxes collected in each province, 9 per cent of the corporate income taxes, and one-half of the estate taxes. Unfortunately, the years immediately following this agreement witnessed pressures on provincial governments to greatly increase expenditure in the areas of health, education, and welfare. The provinces insisted that they could satisfy their constitutional obligations in these areas only if they were given the ability to set their own tax rates. Thus the era of tax sharing in this country was short-lived and ended with the negotiation of the tax collection agreements in 1962.

Tax supplements

A more flexible form of harmonization is the tax supplement approach. Under this approach, subfederal taxes are piggybacked onto the federal tax and are usually expressed as a percentage of the federal tax. Although the tax base is shared by different levels of government, a uniform definition of the tax base is maintained and subfederal levels of government are free to determine the extent to which they will exploit this tax base in their choice of a tax rate. Vertical tax harmonization is preserved under the tax supplement approach, but horizontal tax harmonization is sacrificed to the interests of greater subfederal expenditure discretion.

The tax supplement system has been in vogue in Canada since 1962.

Under the terms of the tax collection agreements negotiated in that year, which have been carried forward more or less intact to the present day, the federal government agreed to collect any provincial income taxes assessed in a province provided that the province accepted the federal definition of the tax base and kept its tax base in general conformity with the one used by the federal government. An important inducement to provincial acceptance of this arrangement is a revenue protection clause that prevents unilateral budgetary changes by the federal government from reducing provincial tax revenues. Alterations in the federal budget that provoke a reduction in provincial personal income tax revenues of more than 1 per cent of basic federal tax owing trigger an automatic transfer to the province from the federal government. Quebec is currently the only province that remains outside of the tax collection agreement for the taxation of individual incomes.

A disadvantage of a system of tax supplements vis-à-vis a separate personal income tax system is that it requires each province to accept the federal determination of the appropriate degree of progressivity in the taxation of personal income. Since 1974, however, this constraint has been relaxed, and the federal government currently allows provinces to apply either tax credits or surtaxes against provincial income tax. Many provinces currently utilize sales and property tax credits to reduce tax burdens for the poor. Saskatchewan, so far, is the only province that has employed a surtax to reduce the incomes of the not-so-poor.

If one takes the current system of tax supplements as the appropriate starting point, one can ask what measures are available to a federation that would allow it to achieve a greater degree of horizontal tax coordination. One approach has already been briefly discussed, namely, a system of equalization payments. Given the highly unequal division of tax bases across the provinces in Canada, equalization payments allow the more poorly endowed regions of the country to provide a satisfactory level of public services without resorting to unduly high rates of taxation. As the Economic Council of Canada has stressed in one of its recent documents, equalization payments both reduce regional differences in the fiscal residual, thereby improving economic efficiency, and contribute to the achievement of greater horizontal equity in the federation, or the more equal treatment of equals by all levels of government combined.[8] Rather than repeat the arguments made by the Council in favour of the equalization program, the following discussion will focus on methods of horizontal tax

harmonization that complements the significant contribution made by the equalization program.[9]

The choice between residence- and source-based taxation

An earlier paper of mine examines the choice of tax principles in open and closed economies.[10] Residence-based taxes levy a burden on income earners where they enjoy or spend their income. Source-based taxes, on the other hand, impose their burden at the point where income is earned or produced. The counterpart of these concepts in the area of commodity taxation are the destination and the origin principles. Under the destination principle commodities are taxed at their point of consumption, while under the origin principle commodities are taxed at their point of production. In closed economies, where resources are immobile and trade flows non-existent, these distinctions are unimportant. They take on greater relevance, however, in an open economy, which is the kind of economy that is likely to confront subfederal levels of government.

In the framework of an open economy, the residence and destination principles of taxation are at once more efficient and more equitable than the source and origin principles. For one thing, a subfederal jurisdiction that elects the former principles rather than the latter is much less likely to be able to export its tax burdens to other jurisdictions - a source of both inefficiency and inequity. Moreover, the destination principle of commodity taxation is much less likely than the origin principle to disturb the pattern of interregional trade flows in a federation. Similarly, the residence principle is much less likely than the source principle to distort the allocation of capital resources in a federation, since it taxes the income received from the ownership of capital rather than the income earned by that capital. The residence principle is also likely to be more equitable than its source alternative, since under the residence principle tax liability is related to the total amount of income that a person receives and is not affected by where he earns it.

The policy implication of this discussion is that subfederal levels of government should eschew both source- and origin-based taxes. In the Canadian context, this would mean that the provinces would vacate the corporate tax field and receive a much smaller share of natural resource revenues - a share that would be determined on the principle of benefit taxation - and that municipalities would be required to cease their taxation

of non-residential property. Provinces and municipalities would draw their revenues jointly from some combination of personal income taxes, taxes on retail sales to provincial consumers, and residential property taxes.

Tax competition

In the absence of a cooperative outcome, each jurisdiction's fears of losing economic activity to other areas if its tax rates become out of line with those imposed elsewhere may impose a competitive discipline on the emergence of tax differentials in a federation. Several examples of this process have been witnessed in Canada recently. When the federal government withdrew from the estate tax field in 1972 and turned this area of taxation over to the provinces, the ensuing provincial scramble for wealthy testators resulted in the rapid disappearance of wealth transfer taxation in this country. While tax competition serves to harmonize tax rates, it does so at a relatively low level. It is interesting that both Ontario and Quebec, which operate their own corporate tax systems, have chosen to maintain general conformance with the federal definition of the corporate tax base, which applies in the other provinces.

In view of the willingness and ability of subfederal levels of government to engage in tax competition, it may seem that the problem of tax harmonization will take care of itself. On the other hand, it is possible to argue that tax competition can have harmful results. Certainly, circumstances can be envisioned in which tax competition would be inferior to a cooperative approach to harmonization, or any of the other ways of harmonizing taxes that have been discussed here. Because tax competition tends to harmonize tax rates at relatively low levels, it can lead to an inefficient level of government expenditure. Moreover, if tax competition occurs on a selective basis across industries, it can contribute to an inefficient interindustry allocation of resources.

Federal tax credits

If the federal government wanted to reduce the disparity in corporate tax rates across provinces, it could introduce a federal tax credit for provincial corporate income taxes paid. This measure would make the total (federal and provincial) tax more uniform than before. However, it would also result in a loss of federal tax base and revenues, and it would confer

windfall revenue gains on low tax rate provinces such as Alberta. Assuming that each province taxed up to the limit of the federal credit, this system would be equivalent to a uniform corporate rate with federal collection and return to the province of origin. Curiously enough, the availability of the U.S. tax credit to U.S. corporations operating in Canada serves to harmonize disparate rates of provincial corporate tax with respect to the treatment of foreign investments. Within limits, an increase in the provincial income tax rate can be offset by a corresponding reduction in U.S. tax liabilities.

FISCAL HARMONIZATION IN OTHER FEDERATIONS[11]

Through most of this century, Australia's fiscal history has borne a close resemblance to developments in Canada. In Australia during the 1920s and 1930s, as in Canada, the direct tax fields were jointly occupied by the federal government and the various states in an extremely uncoordinated fashion. Both the definition of the tax base and the tax rates applicable to that base varied among states and between the states and the federal government. In response to the enormous financial pressures brought on by the Second World War, the federal government became the sole occupant of the income tax field. At the same time, it reserved to itself exclusive access to customs and excise duties and all other forms of commodity taxation.

This wartime reassignment of taxation powers remained in force at the end of the war, and the Australian states became heavily dependent upon federal grants as their main source of finance. This dependence was reduced somewhat in 1971, when the federal government transferred the taxation of payrolls to the states. To a large extent, however, problems of both horizontal and vertical tax harmonization have been avoided in Australia by the suppression of state taxation powers. In the last few years, however, Australia has moved very quickly from a system of tax separation to tax sharing and, finally, tax supplements. In 1976, a little over one-third of the federal personal income tax yield was shared with the states. In 1978, the states were allowed to piggyback onto the federal personal income tax and impose their own personal income tax rates if they wished to receive a larger amount of tax revenue from this source.

In West Germany, on the other hand, a system of tax sharing between the federal government and the various states has been in operation

since 1948. Currently, all of the West German states are entitled to a fixed share of all of the income taxes collected by the federal government, as well as a variable share of the federal value added tax. The states' share of the latter tax is adjusted upwards or downwards with the expenditure needs of the different states, in accordance with the expenditure plans developed by several joint state and federal planning boards. Because the states' share of the value added tax is based on population, rather than on the amount of taxes collected, this scheme for vertical revenue sharing also redistributes tax revenues from high- to low-income states. This implicit equalization effect diminishes the need for an explicit equalization program.

In the United States, the degree of tax harmonization is much less than it is in either Australia or West Germany. Taxes on both personal and corporate incomes are levied by most U.S. states as well as by the federal government.[12] However, very few states adhere to the federal definition of the tax base for either of these taxes. Some of the problems caused by overlapping income taxes and uncoordinated state revenue systems are mitigated by federal tax deductions and tax credits. Almost all state and local personal income taxes are deductible under the federal income tax, and state corporate income taxes are deductible under the federal corporate income tax. Federal deductibility of subfederal income taxes reduces the extent of interjurisdictional variation in effective tax rates. Moreover, the federal government offers an estate tax credit for estate taxes, in order to reduce interstate competition for wealthy taxpayers. Far less success has been realized in harmonizing the crazy-quilt system of state corporate income taxes.[13]

Table 1 compares Canada's approach to tax harmonization with the practices that have been adopted in other federations. Each country is evaluated in terms of its achievement of vertical and horizontal tax coordination, the financial independence attained by subfederal units of government, and the realization of scale economies in tax administration. From these international comparisons, it is clear that Canada has steered a middle course, one that attempts to avoid the inefficiencies that can plague both highly centralized and highly decentralized approaches to tax harmonization. Given what is happening in other federal countries, and given their historical experiments with alternative approaches to harmonization, it is somewhat ironic to discover that these federations appear to be converging on the approach to harmonization that has been in effect in Canada for

TABLE 1
Tax harmonization in federal states

Harmonization effect	Tax separation: Australia	Tax sharing: West Germany	Tax overlapping: Canada	U.S.A.
Tax base harmonization	Yes	Yes	Substantial	Little
Tax rate harmonization	Yes	Yes	No	No
State fiscal autonomy	Little	Substantial	Yes	Yes
Single tax administration	Yes	Yes	Yes	No

SOURCE: Adapted from Thirsk (1981).

the past twenty years and that is currently in danger of being replaced by an uncoordinated system of taxation that exhibits a noticeably smaller degree of tax harmonization.[14]

A BRIEF SUMMARY OF CANADA'S CURRENT CIRCUMSTANCES

Given the range of available policy options, Canada seems to have done relatively well in balancing the pressures for a decentralized revenue system inherent in a federal state with the efficiency gains that can be obtained from a relatively high degree of tax harmonization. The current tax collection agreements, embodying the system of tax supplements for the personal income tax and an allocation formula for distributing the profits of multiprovincial companies in the case of the corporate income tax, have given Canada a high degree of tax base harmonization.[15] Tax competition has also undoubtedly helped to give the country a reasonable degree of tax rate harmonization. As Table 2 indicates, tax rates for both personal and corporate incomes do not appear to vary markedly from one provincial jurisdiction to another. Johnson (1973) points out that with the notable exception of Alberta, which has no retail sales tax, sales tax rates are not widely dissimilar across the provinces. Johnson also points out that there is substantial cooperation among the provinces in dealing with problems that arise from interprovincial transactions.[16]

Nonetheless, the accomplishments of the tax collection agreements in meeting the harmonization objective are threatened by recent provincial

TABLE 2
Provincial income tax rates, 1981

Province	Nominal tax rates (per cent)	
	Personal	Corporate
Newfoundland	58	15-12
Prince Edward Island	52.5	10
Nova Scotia	52.5	13-10
New Brunswick	52.5	14-9
Quebec	-	-
Ontario	46	-
Manitoba	54	15-11
Saskatchewan	52	14-10
Alberta	38.5	11-5
British Columbia	44	16-8

NOTE: No rates are shown where the tax base differs from that in other provinces. In 1982 Alberta withdrew from the tax collection agreements for the corporate income tax. Effective tax rates may diverge from the nominal rates in light of other provisions in provincial tax laws.
SOURCE: Economic Council of Canada (1982).

demands for greater fiscal autonomy. The federal government is caught in an uncomfortable dilemma. Acceding to certain of the provincial requests would mean accepting discriminatory tax practices by the provinces and the sacrifice of a great deal of tax-base harmony. On the other hand, if the federal government turns away these requests, there is danger that the rejected provinces will opt out of the tax collection agreements and that, once again, tax disharmony will prevail. Thus, no matter what position the federal government adopts, it seems as though the present tax collection agreements rest on an extremely fragile foundation.[17] Alberta's recent withdrawal from the corporate income tax portion of the agreements may induce other provinces to follow suit, and a relatively unified method of taxing corporate income may give way to eleven different corporate income tax systems. If this happens, the costs of tax compliance for businesses that conduct transactions in several provinces will increase considerably. Similarly, a withdrawal by Ontario from the personal income tax part of the agreements might elicit the withdrawal of the remaining provinces, especially if it appeared to them that, by withdrawing, Ontario stood to gain some economic advantage at their expense.

Even in the absence of these strains on the country's fiscal fabric, there are a number of imperfections in the existing approach to harmonization that continue to be a source of some concern. Provinces continue to

resort to source-based taxation in an effort to export some of their tax burden to non-residents. For example, in its 1982 budget, British Columbia selectively raised the capital levy applied to banks operating in that province. Similarly, Manitoba introduced in 1982 a payroll tax that is deductible under the corporate income tax system. The payroll taxes are therefore offset to some extent by lower corporate income tax burdens in the province and correspondingly higher tax burdens outside the province. Moreover, as underlined recently by the Economic Council of Canada, the highly unequal distribution of natural resource revenues across the provinces has exposed the equalization program to enormous stress.[18] In view of provincial ownership rights over natural resources, the Council has recommended that only a portion of these revenues be equalized, even though full equalization would be necessary for the attainment of economic efficiency. Finally, it is clear that tax harmonization is not an attractive policy target as long as expenditure policies remain unharmonized. There has, therefore, been a great deal of recent discussion about how the provinces might negotiate a code of fiscal conduct that would reduce the impact of the fiscal residual on the distribution of economic activity across the provinces.[19] An agreement that required collective self-restraint might offer gains to all parties.

THE MERITS OF A SEPARATE PERSONAL INCOME TAX IN ONTARIO

As Table 3 suggests, an Ontario resident's personal tax bills are not widely out of line with the tax burdens he would face were he to move to another province. Only in Alberta, where sales, income, and gasoline taxes are well below the national average (thanks, of course, to the Alberta government's access to abundant oil and gas revenues) would he do significantly better. Except with respect to Alberta, it is unlikely that the existing tax differentials are a strong factor in the interprovincial allocation of labour. Numerous factors besides tax bill differences enter into the migration decision. The locational decisions of business firms, however, are likely to be much more sensitive to differences in tax rates. For this reason, harmonization of corporate taxation may be much more important from a national perspective than harmonization of personal income tax. However, the personal income tax system can influence the decisions that households make regarding their saving, and also the manner in which that saving is put to use. In what follows, therefore, the discussion

TABLE 3
A comparison of personal tax bills by province, 1982[a]

Tax form	B.C.	Alta.	Sask.	Man.	Ont.	Que.	N.B.	N.S.	P.E.I.	Nfld.
Income	$1,998	$1,748	$2,361	$2,452	$2,088	$3,550	$2,381	$2,384	$2,384	$2,633
Gasoline	240	-	230	235	243	252	198	212	315	315
Sales	310	-	280	280	380	420	400	400	450	550
Cigarettes	170	40	165	175	183	200	170	125	125	313
Amusements	-	-	-	-	100	100	110	110	115	-
Health premium	255	228	-	-	552	-	-	-	-	-
Car licence	25	23	12	18	45	25	25	31	25	38
TOTALS	3,378	2,039	3,048	2,960	3,591	4,547	3,284	3,262	3,414	3,849
Rebates/grants	380	200[b]	230	325	-	500[b]	-	300[b]	-	-[b]
NET PAYOUT	2,998	1,839	2,818	2,635	3,591	4,047	3,284	2,962	3,414	3,849

NOTES:
a The table shows the different provincial tax burdens faced by a hypothetical taxpayer who earns $30,000 a year, supports a spouse and two young children, purchases 4,500 litres (1,000 gallons) of gasoline, consumes $5,000 in sales-taxable goods and services, smokes 500 packs of cigarettes (25 to the pack), spends $20 a week on amusements, drives a licensed Chevrolet Citation, and pays his own health insurance premiums.
b Estimates are based on enriched education grants, assuming an average education tax on Ontario residential properties of $500. The Alberta figure includes a $70 natural gas rebate. Newfoundland's denominational school system is largely provincially supported.

SOURCE: Calculations supplied by David Perry, Canadian Tax Foundation, Toronto, 1982.

centers on the ability of a separate personal income tax in Ontario to increase the volume of investment in that province. This variable is perhaps the central, if not the exclusive, target of the proposal for a separate income tax.

An Ontario declaration of independence in taxing personal incomes would presumably be made in the expectation that significant new tax options and revenue opportunities would occur that would somehow create a more favourable investment climate in the province. It is my view that this expectation is for the most part unjustified. There are three reasons why the payoff to a separate Ontario personal income tax would probably be small. First, there is very little that the province cannot already do under the existing tax collection agreements. Second, the existence of an international capital market effectively constrains the province's ability to determine its rate of investment. Third, other provinces would probably retaliate, severely limiting Ontario's ability to draw investment resources away from them. These important issues are discussed in greater detail below.

Three important elements in the design of a personal income tax system are the average tax rate, the dispersion in tax rates or rate structure, and the definition of the tax base. Ontario is already free to establish an average tax rate above or below the rate in other jurisdictions. If the province wants to adjust the federal definition of tax progressivity, it can, for a small administrative fee, ask the federal government to impose either tax surcharges or tax credits and thereby achieve the structure of marginal tax rates that it deems to be desirable. Since the Turner budget of 1974, the federal government has indicated its willingness to accept the provincial notion of vertical tax equity in each jurisdiction.

What Ontario cannot presently do is alter the definition of the personal income tax base in pursuit of its economic goals. For example, Ontario is precluded from adopting a Quebec-style stock option plan, which would make investment by Ontario residents in Ontario-based businesses deductible under the personal income tax. How serious is this limitation on Ontario's taxation powers? There are at least two important considerations here. First, there is the tactical question of how other provinces might respond were Ontario to remove the limitation via tax separation. The perceived advantages of tax separation depend to a large extent on whether other provinces would remain in the tax collection agreements if Ontario left. If they stayed, Ontario might secure more investment spend-

ing, partly at the expense of other provinces, than it would otherwise receive. Such an outcome would bring to the fore the question of the legitimacy of all such beggar-my-neighbour policies, the seriousness of whose effects depends on whether provinces can be viewed as small, price-taking, open economics. For if they can be correctly viewed in this light, they can do little to improve their terms of trade and welfare vis-à-vis others. On the other hand, if Ontario's departure from the agreements signalled their complete collapse, and other provinces retaliated by introducing similar tax measures, the economic benefits of tax separation to Ontario would be greatly reduced. The pressures of inter-provincial tax competition would in these circumstances have produced a peculiarly harmonized income tax system. They would also have pushed the entire country much farther along the road towards replacing the income tax with a de facto expenditure tax - a result that no province would have regarded initially as an attractive one.

The second point worth considering is whether the Ontario fiscal arsenal already contains sufficient ammunition to neutralize any undesired federal tax influence. For example, compare the Quebec program, Les Sociétés de Developpement de l'Enterprise Québecoise (SODEQ), with the corresponding Ontario measure, the Small Business Development Corporation (SBDC). Because it has a separate income tax system, Quebec can encourage SODEQ investments by allowing limited tax deductions for them. Ontario achieves the same end by offering investors in SBDCs a 30 per cent grant towards their investment. Moreover, it might be argued that Ontario's approach is fairer, since the incentive is the same for all investors and does not rise with an increase in the investor's tax bracket. The SBDC grant is a perfect substitute for a tax credit under a separate Ontario personal income tax. This example can be generalized to other situations and illustrates the following important proposition: the main advantage of independent tax base definition is structural differentiation in tax treatment. However, it is possible to duplicate the same fiscal stimulus or reward by an appropriately designed grant or subsidy to particular individuals. From a public finance viewpoint, operating explicitly on the expenditure side of the provincial budget may be preferable to working implicitly on the tax side (via tax expenditures), since it is easier to hold governments accountable for their budgetary activities. Therefore, the current tax collection agreements are more important in limiting how Ontario accomplishes its fiscal ends than in determining what the province

is able to do.

A further degree of freedom is provided by the separate Ontario corporation tax. Many, but perhaps not all, federal tax changes affecting the taxation of investment and business income in the province can be at least partially neutralized by suitable adjustments in Ontario's corporate tax laws. For example, the 1981 Ontario corporate tax holiday effectively countered the dividend distribution tax contained in the November 1981 federal budget and restored the tax advantage to receiving capital rather than labour income from a small business that had existed earlier. As a separate tax on capital incomes, the corporate income tax provides an additional tax instrument for differential tax treatment according to the source of income. A separate personal income tax, however, may permit more satisfactory integration of the tax treatment afforded to unincorporated and incorporated businesses.

The allocative consequences of a separate income tax in Ontario would turn on two key issues that are beyond this paper's scope. One is the nature of the capital market in Canda - the question of whether it operates mainly on a global or a national scale. The other is the degree of probability that other provinces would match any tax inducements offered by Ontario. These two issues are closely intertwined. What might be allocatively beneficial for Ontario might be allocatively harmful from a national perspective. It would be one matter to encourage larger personal savings through a separate income tax system and quite another to make such saving eligible for favourable tax treatment only if it applied to investments in Ontario. Whether the capital market in Canada is national or international in scope, a scheme for promoting greater personal saving might be allocatively desirable, but it would not by itself imply a larger volume of investment in Ontario.

On the other hand, if only saving intended for investment in the province received tax favours, it would matter a great deal how capital markets operated. If there were only a national capital-market influence, a tax-induced investment subsidy in Ontario would distort the geographical allocation of capital within Canada as long as other provinces did not follow suit. Ontario would gain, but at the expense of other provinces. However, if the capital market were international in scope, more saving and investment in Ontario by Ontarians would imply less investment by foreigners: the composition of capital ownership would change rather than the level of investment. Specifically, Ontario source saving would displace

foreign source saving in financing Ontario-destined investment. The level of investment in other provinces would be insulated from the effects of Ontario's tax and fiscal policies, and retaliatory measures on the part of other provinces would be less likely to occur. Under these circumstances, a separate personal income tax could not distort the pattern of investment spending in Canada.

However, even if an international capital market were operative, retaliation could not be entirely ruled out. Other provinces might still introduce retaliatory measures, if they perceived the Ontario initiative as a threat to their own well-being. Moreover, while the allocative distortions in the interprovincial use of capital would be smaller in the context of an operative international capital market, significant interindustry distortions might still occur if fiscal favours applied only to investments in particular industries.

CONCLUSIONS

Among the more important points to emerge from the previous discussion are the following:

1 Uncoordinated tax systems may impair the efficiency of resource allocation in a country and will invariably increase tax collection and compliance costs. Within a federation, the complex task of tax harmonization is to permit diversity of expenditure while minimizing the tax distortions that arise from non-uniform revenue systems.

2 Because expenditure policies can duplicate the effects of many tax policies, fiscal harmonization is a more important objective than tax harmonization. Nonetheless, the harmonization of disparate tax bases and tax rates may contribute to an improvement in resource allocation.

3 Differences between the overall tax bills that individuals find in different jurisdictions will influence the locational decisions of individuals. For business firms, differences in tax rates are one factor affecting their choice of where to operate.

4 Approaches to harmonization encompass a number of options, ranging from tax separation among different levels of government to tax sharing and a system of tax supplements. Canada has experimented with all of these approaches and currently relies on the last to sustain a substantial degree of tax base uniformity across the country.

5 Source- and origin-related taxes are particularly inappropriate tax bases for subfederal levels of government. Accordingly, tax harmony would be enhanced if provinces and municipalities confined their tax reach to personal income, retail sales, and residential property, limited their taxation of natural resources, and refrained from taxing corporate incomes and nonresidential property.

6 Canada has steered a middle course between fiscal uniformity and fiscal autonomy. The current tax collection agreements maintain substantial tax base uniformity, while tax competition limits tax rate diversity. The challenge for the future is to prevent any radical departure from this middle course.

7 Speculation on the impact of a separate personal income tax in Ontario indicates that the potential for economic gain is highly problematic. For one thing, a substantial degree of fiscal freedom already exists. For another, the prospects of retaliation by other provinces and the existence of an international capital market might negate any advantages that ensued from greater provincial discretion in personal income taxation and tax-induced efforts to achieve a higher level of investment spending.

NOTES

1 Perhaps the seminal work in this area is the collection of articles found in Shoup (1977). This volume contains an excellent treatment of the important conceptual issues that form the framework for any tax harmonization policy. In a Canadian context, the closest approximation to the Shoup volume is the monograph by Shibata (1969). He presents a lucid discussion of the problem of tax harmonization and approaches to dealing with it, although his emphasis is primarily on international, rather than intranational, tax harmonization.

2 This standard interpretation of the matter is evident in Oates (1972), which has become something of a minor classic in the literature relating to the economic problems of federal countries.

3 Dosser (1967) distinguishes between an equalization approach to tax harmonization, which asks whether equal tax rates will improve economic efficiency, and a differentials approach, which seeks the pattern of tax rate disparities that will maximize economic efficiency. This distinction is similar in spirit to the two interpretations of the task of tax harmonization that are stressed here.

4 See Thirsk (1980, 124). The notion of a fiscal residual has been around for some time but was orginally considered in the context of how to achieve regional equity in a federal economic system. Only recently have its implications for the achievement of economic efficiency been thoroughly explored.

5 This conclusion is consistent with the central proposition of the well-known Tiebout model of local public goods. In that model, given a large number of competing jurisdictions and a high degree of inter-

jurisdictional mobility on the part of taxpayers, tax differentials are rooted in divergent preferences for public goods and are clearly non-distorting. While the point is an important one, the Tiebout model rests on a number of strong assumptions that limit its relevance. In addition to assuming perfect mobility and an extremely large number of jurisdictions, each catering to distinct tastes, the model abstracts from the presence of fiscal externalities, the use of distorting local taxes, and the spatial costs of fiscal separation. Many of these limitations are clearly spelled out by Pestieau (1977).

6 The argument is presented in chapter 8 of the report of the Parliamentary Task Force on Federal-Provincial Fiscal Arrangements (1981).

7 A recent and concise summary of the recommendations of the Rowell-Sirois Commission is found in the report of the Parliamentary Task Force on Federal-Provincial Fiscal arrangements (1981), as is a historical description of the evolution of Canada's federal-provincial fiscal arrangements.

8 See Economic Council of Canada (1982), especially chapters 3 and 5. In the Council's view, equalization payments serve to offset the locational distortion that arises from rent-seeking labour migration.

9 In a recent paper (Thirsk 1981), I have suggested that equalization plays an important indirect role in tax harmonization by discouraging provincial governments that receive payments from reducing their tax rates below the national average in order to attract a larger tax base.

10 See Thirsk (1980, 126-30) for a more extensive discussion of these different principles of taxation.

11 Much of the material in this section is condensed from my 1981 paper, which also examines the highly decentralized fiscal approach of Switzerland's federal economy.

12 Break (1980) presents a clear analysis and discussion of the problem of tax harmonization in the United States and of the means that country has employed to coordinate fiscal relations between the three levels of government.

13 The irrationality of taxing corporate incomes at the state level is underlined by McLure (1977 and 1981).

14 The less harmonized revenue systems found in the United States and Switzerland appear to be progressing toward much greater tax base harmonization. Australia is moving towards the fiscal model represented by Canada's tax collection agreements from the opposite direction.

15 A detailed account of the development of Canada's allocation formula for corporate profits is given by Smith (1976). Huggett (1977) makes a strong case for the retention of this aspect of tax harmonization.

16 Johnson (1973) notes that the problems of sales tax harmonization in Canada are eased by the absence of large border cities, Ottawa and Hull being the principal exceptions to this pattern. Johnson also uses the example of Lloydminster to illustrate the difficulties that can arise when different sales tax administrations collide.

17 In September of 1982, a significant crack appeared in the federal government's resistance to provincial pressures for special tax incentive schemes. The federal government approved British Columbia's plan for a housing and employment bond tax credit, which, by permitting a rebate of provincial tax on $250 million of B.C. bonds, will flow funds to the province's housing sector at a lower interest rate. It is difficult to believe that other provinces will not ask for similar treatment and introduce their own incentive programs.

18 See Economic Council of Canada (1982), chapters 2 and 4 in particular.

19 Proposals for the creation of such a code are presented in Economic Council of Canada (1982, ch. 9) and in the Report of the Parliamentary Task Force on Federal-Provincial Fiscal Arrangements (1981, ch. 8).

REFERENCES

Break, G. (1980) Financing Government in a Federal System (Washington, D.C.: The Brookings Institution)

Dosser, D. (1967) 'Economic analysis of tax harmonization.' In C. Shoup, ed. Fiscal Harmonization in Common Markets (New York: Columbia University Press)

Economic Council of Canada (1982) Financing Confederation (Ottawa: Ministry of Supply and Services)

Huggett, D. (1977) 'Tax base harmonization.' In Intergovernmental Relations: Issues and Alternatives (Toronto: Ontario Economic Council)

Johnson, J.A. (1973) 'The treatment of interprovincial transactions under the sales tax.' In Proceedings of the Sixty-sixth Annual Conference on Taxation (Columbus: National Tax Association)

McLure, Charles E., Jr. (1977) 'Taxation of multijurisdictional corporation income: lessons of the U.S. experience.' In W. Oates, ed. The Political Economy of Fiscal Federalism (Lexington, Mass.: D.C. Heath and Co.)

- (1981) 'Toward uniformity in interstate taxation: a further analysis.' Tax Notes 13, no. 2

Oates, W.E. (1972) Fiscal Federalism (New York: Harcourt Brace Jovanovich)

Parliamentary Task Force on Federal-Provincial Fiscal Arrangements (1981) Fiscal Federalism in Canada (Ottawa: Ministry of Supply and Services)

Pestieau, Pierre (1977) 'The optimality limits of the Tiebout model.' In W.E. Oates, ed. The Political Economy of Fiscal Federalism (Lexington, Mass.: D.C. Heath and Co.)

Shibata, H. (1969) Fiscal Harmonization Under Freer Trade: Principles and their Applications to a Canada-U.S. Free Trade Area (Toronto: Private Planning Association of Canada)

Shoup, C. (1977) 'Interregional economic barriers: the Canadian provinces.' In Intergovernmental Relations: Issues and Alternatives

(Toronto: Ontario Economic Council)

Smith, E.H. (1976) 'Allocating to provinces the taxable income of corporations: how the federal-provincial allocation rules evolved.' Canadian Tax Journal 24

Thirsk, W. (1980) 'Tax harmonization and its importance in the Canadian federation.' In R.M. Bird, ed. Fiscal Dimensions of Canadian Federalism (Toronto: Canadian Tax Foundation)

- (1981) 'Fiscal harmonization in the U.S., Australia, West Germany, Switzerland and the EEC.' Paper presented at a conference of the U.S.-Canada Law Institute, London, Ontario

- (1984) 'Tax harmonization in Canada.' In G. Break, ed. State and Local Finance: the pressures of the 80s. Published for the Committee on Taxation Resources and Economic Development. (Madison, Wisconsin: University of Wisconsin Press)

Some Observations on the 'Powers Over the Economy'

Richard Simeon*

The following notes were originally prepared during the summer of 1980, when the broad issue of 'powers over the economy' first became a major issue on the constitutional agenda. They have been modified slightly to take into account the provisions of the Constitution Act of 1982 bearing on the Canadian common market. The debate in 1980 was bound up with the larger constitutional struggle between governments. It did not therefore permit a full and careful discussion of the economic dimensions of federalism. By 1983, the need for such a discussion was evident. The economic crisis had shifted attention to the central question of the way federalism relates to the overall management of the Canadian economy. Analysis of this issue requires us to focus not only on the question of how federal or provincial policies affect the common market, but also on the broader question of the role of governments in economic development, and of the most appropriate division of labour among them. We need to blend theories of federalism with theories of the role of the state in advanced capitalism. Thus the problem for this paper - how to police the common market and develop a mechanism for balancing federal and provincial interests while doing so - is now but part of a much larger debate, which will be taken up by the Royal Commission on the Economic Union and Development Prospects for Canada (MacDonald Commission) and others.

The question of the extent to which provinces should be free to promote their own economic development and the extent to which the federal government should have responsibility for overall economic management, stabilization, and redistribution has always been at the heart of the debate over the division of economic powers between the two levels of gov-

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ernment.[1] But recently the character of that debate has taken on new dimensions. Until recently, it was the provinces that sought to extend their powers in economic areas (fisheries, natural resources, off-shore rights, indirect taxation, limitations on trade and commerce, and emergency powers) and the federal government that was on the defensive. The first indication of a shift came in February 1979, when, in addition to concessions such as the 'best effort' draft on natural resources, the federal government served notice of its desire to discuss a 'second-list' of important economic powers. This thrust intensified in the 1980-81 round of constitutional negotiations.[2] It is now the provinces that see Ottawa not only resisting further transfers of power, but also seeking to limit the provinces' control over their own economic development and to play a larger role in national economic policymaking.

There are also many indications that non-government groups have come to emphasize the need to reduce barriers. The concept of economic union was a theme of the report of the Task Force on Canadian Unity (1979), and was even more prominent in the proposals of the Constitutional Committee of the Quebec Liberal Party's Beige Paper (1980). The Business Council on National Issues and others have also argued for a renewed effort to reduce barriers.

While broader economic issues hover in the background and will no doubt reappear in subsequent rounds of discussion, the focus of the debate on economic powers has so far been on the need to reduce provincial barriers to trade and interference with the free flow of goods, services, labour, and capital in the Canadian common market. While this issue is vitally important, the emphasis on it casts the question of 'powers over the economy' far too narrowly.

Concern with the issue of barriers to movement and trade has arisen from several sources: the impact of some highly visible and widely publicized recent provincial action seen to limit trade; the debate on sovereignty-association (ironically enough), which focussed attention on the nature and role of common markets; a renewed interest in constitutional affairs by academic economists and some businessmen; and the intensification of economic conflict between Canadian regions, centered frequently on the location of economic activity. Lengthy catalogues of various provincial (and federal) actions limiting the operation of the common market and the free flow of capital, goods, and persons have been produced (See Shoup 1977, Trebilcock et al. 1977, and Safarian 1980). There is general agree-

ment that such barriers both limit individual opportunities and in total erode the economic benefits of a larger market. There is also general agreement that even if the negative impact of these barriers is impossible to measure, the overall tendency is towards increasing provincial protectionism and that this tendency should be resisted. But here agreement ends.

There are some unfortunate aspects to this heavy concentration on barriers to movement and trade. First, it may be slightly misplaced. It does seem to be true that Canada is becoming less economically integrated. However, it is likely that this trend owes far more to some fundamental characteristics of the Canadian economy and society - dependence on foreign markets by specialized regional producers, foreign ownership, and cultural, linguistic, and geographical barriers - than it does to government-erected barriers such as provincial purchasing policies. It is these larger dimensions of Canadian economic integration that need attention. Second, despite the impressive lists of provincial non-tariff barriers, no one has successfully measured their actual costs; we are not really sure whether the problem is 'real' or primarily symbolic.[3] Therefore, constitutional prohibition is no economic panacea. Third, the 'bads' of barriers, like the 'goods' of the free market, are probably not evenly distributed across Canada: there can still be powerful short-run attractions to a regional economy in protectionism, even if in the long run it may be irrational for the region, not to mention the national economy. More generally, it is the stronger regions, nations, and firms that tend to argue most vigorously for free markets, and that tend to benefit most from their existence. Fourth, promotion of economic integration and of the benefits of a large market depends on a great deal more than the elimination of internal barriers. It also requires positive elements, such as effective national transportation and communications networks and, even more important, the creation of <u>mutually</u> advantageous economic linkages between provinces.[4] Much more attention to these dimensions - not only in the constitution - is critical. Fifth, the focus on barriers to free trade has an open-ended quality. Almost by definition, any government action interferes with the free movement of goods, services, people, or capital. Virtually every policy difference between provinces - and federalism is presumably designed to encourage such differences - may cause impediments to free movement. Indeed, it could be argued that the sudden prominence of the 'economic union' issue arose from the conjunction of

Ottawa's search for a political means to assert its status, limit that of the provinces, and promote 'national' values and a growing 'neo-conservative' preference for market forces over almost any kind of government intervention. Such an alliance is especially evident in the forces behind Bill S-31, designed to limit provincial agencies' holidays in interprovincial transport firms (see Tupper 1983).

The answer, however, is not to eliminate all interregional barriers to trade. To do that would be to argue for a unitary state - or, perhaps, for the abolition of the state. The task, rather, is to find the acceptable trade-off between the desire for freedom of market forces and maximizing overall wealth and the other goals, economic, social, and cultural, that motivate citizens and their governments. It is also to find a workable distinction between provincial economic development policies that are 'discriminatory' and those that are not. That is eminently and necessarily a political process. Moreover, the more specific and limited task is to somehow distinguish between government actions that are 'legitimate' efforts to promote economic development and other goals and those that are so clearly discriminatory against individuals from outside the region, or so clearly designed to promote development at the expense of other regions, that they cannot be permitted. That distinction is very difficult to make, both conceptually and politically. It is extraordinarily difficult to know how to write it into a constitution. We should therefore be careful not to lock ourselves into constitutional guarantees of the market that become unworkable, or that prohibit Parliament and the provincial legislatures from taking effective action in the public interest. Instead, the emphasis should be on a workable mechanism for blocking threats to the market.

Finally, we must recognize that the specific question of non-tariff barriers to trade is only one small part of the more general issue of the role of government in the economy. Indeed, it is predicated in part on a somewhat unrealistic view of both the reality and the efficacy of market forces; it omits consideration of the wide range of tools used in contemporary economic policymaking and assumes a laissez-faire approach. While the federal drafts of 1980 recognized these wider dimensions of 'powers over the economy', and introduced some important qualifications, it is unfortunate that the question was not debated in the broader context of the whole range of the role of government in the economy.

Three specific issues arise in the current debate:

1. Should there be constitutional rules or provisions respecting the Canadian common market?
2. If so, how flexible or rigid should they be?
3. How should they be enforced or policed?

I take it as now fully accepted that the constitution must not remain silent on the question. Whatever interests individuals and governments may have that lead them to favour barriers in specific cases, few if any favour them in principle. And, indeed, the Constitution Act of 1982 does contain some provisions that have a bearing on the common market. These provisions are related primarily to the mobility of individuals. Section 6(2) guarantees the right of any citizen or permanent resident to reside and gain a livelihood in any province. This right is subject to some conditions. The act does not invalidate general laws that do not discriminate on the basis of present or former residence. It allows governments to impose 'reasonable' residency requirements for eligibility for social services. What is more important, the act does in certain circumstances grant a very broad exemption from the mobility provision: it allows governments to introduce programs that discriminate in favour of 'socially or economically disadvantaged' individuals in a province when the province's employment rate is below that of the country as a whole. On the other hand, mobility within Canada could be enhanced by some of the language rights sections of the act, especially those that deal with minority language rights. Finally, the new Section 92A, which deals with resources, permits provinces to make laws respecting interprovincial trade, subject to a prohibition on discrimination in prices or supplies, and to a federal override. Similarly, provinces are given the right of indirect taxation of resources, subject to the same rule against discrimination.

These provisions indicate a realization that some flexibility is required, that the absolute prohibition of barriers to trade would be unworkable, and that there are legitimate federal and provincial goals that warrant some infringement on freedom of movement. Ottawa's original proposal for a Charter of Rights, for example, would have permitted exceptions to its provisions that were 'reasonably justifiable in a free and democratic society in the interests of national security, public safety, order, health and morals' (Canada 1980). One major problem is how such 'escape clauses' are to be interpreted by the courts. On the one hand, it is hard to imagine the courts invalidating <u>any</u> law, given such a qualifi-

cation. On the other hand, if faced with a case in which a provincial attorney-general argued that a law was reasonably justifiable, and a federal lawyer argued that it was not, a court would be forced into great difficulty unless the constitution provided it with clear criteria for arriving at a decision. These questions remain in the provisions of the Constitution Act of 1982. Section 1, for example, now states that rights and freedoms, including mobility rights, are subject to 'such reasonable limits as can be demonstrably justified in a free and democratic society' (emphasis added). Regarding Section 6, meaning will have to be given to terms such as 'reasonable residency requirements', and to what constitutes 'discrimination'. Thus, the flexibility now written into the constitution carries with it a great deal of uncertainty as to whether freedom of movement has indeed been strengthened. The significance of the exemption for provinces with a lower-than-average employment rate is especially problematic. My purpose here is to emphasize the great difficulty of trading off different kinds of goals and weighing them against each other, and the difficulty of writing them into constitutional language. The question really is: who is to decide how such trade-offs are to be made? We must decide not only how much to value the common market over other goals, but also who, using what kind of criteria, is to enforce the decision.

POLICING THE COMMON MARKET

The policing of the common market is perhaps the critical issue in dispute. None of the methods recently proposed is fully satisfactory: each has notable advantages and disadvantages. Three methods have been suggested:

- judicial enforcement of rights for citizens and of restrictions on governments;
- making the federal government the guarantor and policeman;
- some kind of intergovernmental process.

The advocates of each method would probably agree that the preamble to the constitution should contain a general statement of a commitment to enhance and maintain the benefits of the Canadian common market, and a commitment to the sharing of those benefits.

In 1980, the federal government suggested a combination of en-

trenched rights and federal surveillance to ensure protection of the market. Saskatchewan and Quebec in particular argued for an intergovernmental process. The choice between these alternatives is most difficult.[5] The provisions of the Constitution Act of 1982 opt for the first alternative, but themselves reflect the bargaining that preceded their adoption, in which governments sought to minimize the constraints the new provisions would place on them.

A brief outline of some of the main advantages and disadvantages of each alternative follows.

Judicial enforcement

At present the constitution upholds the free movement of individuals (in the Charter of Human Rights) and domestically produced goods (in section 121[6]). The extension of mobility rights to all factors of production would lead the courts to play an even more central role as the arbiters of legitimate government action and the guardians of the common market.

Advantages

- Resolution of individual cases is final and authoritative.
- After an initial period of uncertainty, judicial enforcement provides a more stable framework for private decision-makers than shifting political accommodations.
- Most important, citizens and private organizations can initiate actions, thus ensuring that the rights of individuals rather than governments prevail.

Disadvantages

- The courts, as presently constituted, lack knowledge and expertise in economic affairs.
- By their nature, judicial decisions are black and white, yes or no. The courts cannot and should not make positive proposals. Hence, judicial enforcement cannot ensure compromise and trade-offs; it is ill suited to weighing 'the bads' of barriers and 'the goods' of other goals.
- Judicial decision may short-circuit the process of negotiation between competing but legitimate interests.

- Judicial enforcement involves a long period of uncertainty, not only with respect to new initiatives but also with respect to the vast array of existing federal and provincial policies, while the courts develop and clarify the meaning of new facts and their qualification. Indeed, none of the constitution-makers could predict which way the courts would go, and thus could not predict the actual impact of the new provisions they had written.
- Judicial enforcement can, by definition, apply only to the provisions of the constitution. Yet the constitution can address only the most clear and overt barriers to trade - it cannot address most of the policy instruments that shape trade and investment patterns.
- Judicial enforcement is inappropriate when political and intellectual consensus on the nature, impact, and significance of the problem does not yet exist. The courts have to create their own theory and policy.
- Judicial enforcement reduces parliamentary and legislative supremacy.

Given the disadvantages of judicial enforcement, I would not wish to invite the courts further into the making of new laws in this area. The Constitution Act's general statement of the right of freedom of movement, with its focus on individuals, is sufficient.

Federal enforcement

Federal enforcement of the common market has been proposed in the form of extension of the trade and commerce clause (Section 91[2]) of the 1982 Constitution Act to encompass 'goods, services and capital' and to allocate competition, product standards, securities regulation, and perhaps other matters to the federal government. The significance of the former proposal is unclear, since it can be argued that the existing clause already implies goods, services, and capital. On the other hand, broadening Section 91(2) could be an invitation to expand the use of the clause to legitimate almost unlimited federal power in economic affairs, such as the government of the United States possesses.

But what are the advantages and disadvantages of federal policing, whether achieved by a new draft of Section 91(2) or by a more direct allocation such as an economic 'peace, order, and good government' power or a 'disallowance' power directly tied to economic matters?

Advantages

- Federal policing is consistent with the other federal roles of overall economic management, stabilization, and redistribution.
- It is subject to parliamentary, democratic discretion.
- Ottawa is the only government with the explicit role of maximizing aggregate national wealth, achieving regional balance, reconciling conflicting regional interests, and enhancing the overall economic surplus.
- It is consistent with the positive mandate of Ottawa to promote economic integration through transportation and the like.

Disadvantages

- As with other discretionary federal powers to invalidate provincial action, or to act in areas of provincial jurisdiction, this power could be inconsistent with a classical federal model.
- It could be an open invitation to the extension of federal power, with no logical stopping place.
- It could involve a continual threat of major federal-provincial confrontation.
- The political argument against federal policing is that, so long as federal governing parties are unable to win representation across all regions, Ottawa will be insensitive to provincial goals and be more responsive to control Canadian interests. The federal government could not therefore be regarded as an impartial policeman.
- It would create uncertainty, because provinces would never know when activities they had entered into would be challenged.
- The concept of federal policing ignores the fact that many 'barriers' to the common market in Canada are created not by the provinces but by federal action in pursuit of a variety of national goals, most notably the alleviation of regional disparities.

Policing through intergovernmental cooperation

The possibility of creating some kind of federal-provincial mechanism to avoid the pitfalls of the first two alternatives has been raised by the Ontario Advisory Committee on Confederation and others. It was placed on the constitutional table by Saskatchewan in a proposal for a detailed gener-

al statement of commitment to the common market, mobility, and harmonization of laws and a pledge of 'ongoing systematic and cooperative review' by governments of the operation of the union. More recently, Ottawa sought to tie discussion of fiscal arrangements, especially harmonization of the tax system, to development of a 'code of tax conduct'.

Advantages

- Adoption of a federal-provincial policing mechanism would be a symbolic commitment that might make infringements of the market more embarrassing politically than they are at present.
- The proposal is politically acceptable to many provinces because it is the alternative least disruptive of the status quo.
- Federal-provincial cooperation would locate protection of the market in an explicitly political process, subject to negotiation, trading, compromise, and the balancing of different interests.
- The proposal relates the issue of the market to wider economic goals and recognizes that federal-provincial collaboration is essential to the development of effective national policies in many areas.

Disadvantages

- There is no guarantee that the commitment to harmonization and promotion of trade would work any better under the proposed arrangement than it has in the past.
- The proposal provides no clear role for citizen input, and no guarantee that an accommodation acceptable to governments would not threaten private interests.
- The proposal's very acceptability to many provinces implies that the Ottawa and Ontario goals of a reversal of trends to protectionism would not be met.
- As now written, the proposal consists only of a moral injunction, with no provision for enforcement.

This analysis shows that each of the mechanisms for constitutionalizing the commitment to the common market has major objections from a number of points of view. The question thus arises: is it possible to find a formulation that would be both acceptable and effective? Two aven-

ues suggest themselves, both of which build on the collaborative approach suggested by Saskatchewan.

The first would be to allow the federal government the policeman's role, but to subject its use of that role to the same kind of provincial consensus mechanism that has been suggested for federal use of the spending and emergency powers in areas of provincial jurisdiction. Thus, if Ottawa felt that a provincial action interfered unduly with the common market and should be either withdrawn or overruled by federal action, then it would be required to gain broad provincial support.

The second, and preferable, approach would be to make the eleven governments collectively responsible for preserving the common market, and to give the resulting federal-provincial body the power, under the constitution, to formally overrule serious transgressions. Such a body could be a standing committee of a House of Provinces or Federal Council.[7] Alternatively, the committee could be made responsible to the First Ministers' Conference, or it could even be given an independent existence.

The committee would have the broad economic policy coordination and harmonization role suggested by Saskatchewan and, at other times, by Ontario. It could be a forum for discussion and mutual influence on specific policies, with no formal votes taken. It could also be a forum for working out a formal code of economic conduct, which would clarify the legitimate economic roles of both levels of government and specify what kinds of action - in taxing, spending, and regulation - are legitimate exercises of provincial power. But when any government felt that the action of another had seriously and detrimentally interfered with the market, or imposed unacceptable costs on residents of other provinces, it could formally bring the issue to the Council. If, after debate, the action were not modified or withdrawn, there would be a vote. If Ottawa plus some proportion of the provinces voted against the provincial action, it would be defeated.

From where would the committee derive its mandate and role? It could derive them directly from the commitment to a free market stated in the preamble to the Constitution. This is a possibility, but it would set a precedent by giving the preamble a directly enforceable character (at least in this one part) out of keeping with the symbolic role usually attributed to it. It is also important for the mechanisms giving effect to a principle to be closely linked to the statement of the principle itself. This would be hard to do.

Therefore, I think the better option would be to work from the federal proposal for an expanded section 121, blending its objectives with the wording in the Saskatchewan paper and adding my proposed enforcement mechanism. Thus 121 could be reformulated as follows:

121.1 Neither Canada nor any province shall by law or practice affect the movement throughout Canada of persons, goods, services, or capital in such a manner as unduly to impede the operation of the Canadian economic union or to discriminate on the basis of province or territory of origin of such goods, persons, services or capital.

.2 Legislation or practices undertaken by the legislature of any province or by Parliament which are deemed by any other legislature or by Parliament to violate in its pith and substance subsection (1) of this section shall be adjudicated in the following manner:

a) A federal-provincial Committee on Economic Affairs is hereby constituted as a permanent committee of the Federal Council [if applicable].

OR

a) A federal-provincial Committee on Economic Affairs is hereby constituted.

b) It shall be the function of this Committee to:

i. engage in a continuing review of the operation of the common market and of policies which affect it.

ii. Actions deemed by any government to violate subsection (1) and which are not resolved by discussion in a reasonable period may be appealed to the committee for a formal ruling.

iii. If a majority of the Committee, consisting of the representatives of the Government of Canada and the representatives of a majority of the provinces [formula could vary], so agree, then the act or practice in question shall be declared ultra vires and invalid, and shall not be subject to further appeal to the courts.

c) The Committee will meet from time to time as its members decide, or when formal appeal is initiated.

A not-so-hypothetical example of how the process might work is presented by Newfoundland's policy of preference for provincial residents in employment in the off-shore oil industry. It perfectly illustrates the kinds of competing values that arise. On one hand, it is a clear barrier to the freedom of movement of labour. On the other hand, given Newfoundlanders' level of unemployment and desire to preserve a distinctive way of life, there is a very strong case for the policy. The question is - what kind of trade-off would be desirable? If the matter were raised in the committee, the result could be any one of a number of compromises, such as to allow the policy for a specified time period, or to allow the

province to require the companies to establish local hiring offices or training facilities. Many of these compromises would be preferable to the blanket exemption of provinces with lower-than-average employment rates from the mobility provisions in the new charter. Both Newfoundland and the other governments would have an incentive to work out such a compromise.

What follows is a list of the advantages and disadvantages of my proposal for a federal-provincial Committee on Economic Affairs:

Advantages

- It avoids some of the pitfalls of either judicial or unilateral federal enforcement, but does provide a clear inforcement mechanism.
- It does not subordinate provinces to either Ottawa or the courts.
- It means that provincial governments are disciplined by their peers.
- It provides the right mix of motives and incentives. On the one hand, the provinces would not want to bar one of their number from the use of a policy goal or instrument that they might want to use in the future themselves; on the other hand, they would not want another province to use unfair competition against them.
- It provides a mechanism for achieving a very important goal. What the debate so far really shows is that in the long run we need to develop some sort of 'Code of Acceptable Conduct' that would make clear what kinds of provincial development are acceptable and legitimate - and would equally make clear which tools are so discriminatory that they must be rejected. The issues here are complex. We are very far from knowing how to write them in constitutional form. They are fundamentally subject to negotiation. Over time, the Economic Affairs Committee could develop this sort of code; eventually it could even be written into the constitution.
- The Committee could also be a forum for the more positive discussion of how to <u>improve</u> coordination, trade, and the like within Canada.
- The Committee would be well-suited to make the necessary political trade-offs. Unlike the courts, the committee could discuss unobjectionable actions in a manner that led to modifications, time-limits, and alternative means of achieving the same ends.

Disadvantages

- It introduces a wholly new principle - collective intergovernmental limitations on individual governments. While this has been widely discussed in terms of provincial constraints on federal discretionary powers, it has not been thought of in terms of provinces constraining each other. This might be hard to accept.
- A policing role for the Committee might interfere with its more consensual policy coordination and harmonization role. On the other hand, the threat of formal veto, combined with the fear of the kind of confrontation that a veto would entail, might well create incentives for the more important coordination role.
- There would be no direct citizen access, except insofar as citizens could convince governments to raise their case.
- A tough decision rule does imply a presumption to accept a province's action. The rule could be modified to make it easier to reject a provincial action.
- It is unlikely that this procedure would roll back many existing non-tariff barriers.
- The role that Ottawa's vote would be necessary to forbid a given policy means that federal policies could never be vetoed. This rule may well be justified, given other constraints on federal action, but it could be modified to permit an enhanced provincial majority to defeat Ottawa. A number of other recent proposals have suggested some kind of provincial consent mechanism for certain federal initiatives, such as use of the spending power in areas of provincial jurisdiction, or use of the emergency and declaratory powers.

CONCLUSION

The complexity and confusion surrounding the issue of the Canadian common market, despite the clear agreement that it is now threatened and must be protected, relates to the much wider question of the evolution of federal and provincial powers over the economy. These notes have wrestled with the problem with the same unease that officials and politicians no doubt feel when they grapple with it. I propose the federal-provincial committee not as an ideal, but as a possible compromise, and as just one possible way of thinking about an intractable problem.

To summarize the proposal here:

1. The preamble to the constitution should strongly state the commitment to the maintenance and extension of the Canadian common market.
2. The constitution should stress mechanisms to achieve the goals stated in the preamble, rather than state those goals in very precise terms.
3. Primary responsibility for maintaining the market should not be given to any one level of government, or to the courts.
4. The constitution should establish a federal-provincial mechanism for much more continuous intergovernmental interaction on the economy, including not only protection against internal trade barriers but also discussion of the relationships between federal and provincial economic policies and of ways they can be more fully coordinated. Ultimately, the latter is much more important than the former. The primary justification for a formal enforcement mechanism as a last resort is not that it would or should be used often. Rather, it is to underline the necessity of greater cooperation and to create the incentives to develop it.

NOTES

1 Probably the first published examination of the economic union and the constitution is in Safarian (1974).
2 The primary document here is Chrétien (1980).
3 For an attempt to remedy this situation, see Whalley (1983).
4 Examples of attempts to do so are the proposal for a Canadian Domestic Market Development Agency in Ontario (see Ontario 1981), the proposals of the Task Force on Major Capital Projects in Canada to the Year 2000 (1981), and the federal economic development paper of November 1981, which sought to link central Canadian manufacturing more firmly to resource-led development in western and Atlantic Canada.
5 For a review of the ministerial discussions of 1980, see Zukowsky (1981).
6 'All Articles of the Growth, Produce or Manufacture of any one of the Provinces shall ... be admitted free into each of the other Provinces.'
7 Versions of such a Council or House of Provinces have been proposed in a large number of constitutional blueprints, including those of the Canadian Bar Association (1978), the Task Force on Canadian Unity (1979), the government of British Columbia (1978), the Constitutional Committee of the Quebec Liberal Party (1980), and the government of Alberta (1982).

REFERENCES

Alberta (1982) A Provincially-Appointed Senate: A New Federalism for Canada (Edmonton)

British Columbia (1978) British Columbia's Constitutional Proposals (Victoria)

Canada (1980) Proposed Resolution Respecting the Constitution of Canada (Ottawa)

- (1981) Economic Development for Canada in the 1980s (Ottawa)

Canadian Bar Association, Committee on the Constitution (1978) Towards a New Canada (Montreal)

Chrétien, Jean (1980) Securing the Canadian Economic Union in the Constitution (Ottawa: Minister of Supply and Services)

Constitutional Committee of the Quebec Liberal Party (1980) A New Canadian Federation (Montreal)

Ontario Ministry of Industry and Tourism (1981) Interprovincial Economic Cooperation (Toronto)

Safarian, A.E. (1974) Canadian Federation and Economic Integration (Ottawa: Information Canada)

- (1980) Ten Markets or One? (Toronto: Ontario Economic Council)

Shoup, Carl (1977) 'Interregional economic barriers: the Canadian provinces.' In Ontario Economic Council, Intergovernmental Relations: Issues and Alternatives, 1977 (Toronto)

Task Force on Canadian Unity (1979) A Future Together. (Ottawa: Minister of Supply and Services)

Task Force on Major Capital Projects in Canada to the Year 2000 (1981) Report (Ottawa: Minister of Supply and Services)

Trebilcock, M.J. (1977) 'Interprovincial restrictions on the mobility of resources.' In Ontario Economic Council, Intergovernmental Relations: Issues and Alternatives, 1977 (Toronto)

Tupper, Allan (1983) Bill S-31 and the Federalism of State Capitalism. (Kingston: Institute of Intergovernmental Relations)

Whalley, John (1983) In R. S. Prichard et al., Federalism and the Canadian Economic Union (Toronto: Ontario Economic Council)

Zukowsky, Ronald J. (1981) Struggle Over the Constitution (Kingston: Institute of Intergovernmental Relations)

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.S477

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ISSN 0225-591X

ISBN 0-7743-8691-6